CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

ORDER No. 98-076
NPDES PERMIT NO. CA0037810

REISSUING WASTE DISCHARGE REQUIREMENTS FOR:

CITY OF PETALUMA WATER POLLUTION CONTROL PLANT, SONOMA COUNTY

The California Regional Water Quality Control Board, San Francisco Bay Region, hereinafter called the Board, finds that:

1. The City of Petaluma, hereinafter referred to as the discharger, applied to the California Regional Water Quality Control Board, San Francisco Bay Region, for reissuance of waste discharge requirements and permit to discharge wastewater to waters of the State and the United States under the National Pollutant Discharge Elimination System (NPDES).

FACILITY DESCRIPTION

2. The discharger owns the municipal wastewater treatment plant located at 950 Hopper Street in Petaluma, Sonoma County, and presently contracts with U.S. Filter/EOS (formerly Wheelabrator EOS) to operate the facility. The plant provides secondary level treatment for combined domestic, commercial and industrial wastewater collected in the City of Petaluma, the nearby community of Penngrove, and unincorporated areas in the vicinity of Petaluma. The discharger's service area currently has a population of approximately 49,800 people.

3. The U.S. Environmental Protection Agency (USEPA) and the Board have classified this discharger as a major discharger.

PURPOSE OF ORDER

4. This NPDES permit regulates the discharge of treated wastewater to the Petaluma River, waters of the State and the United States. This discharge was previously governed by Waste Discharge Requirements in Order No. 90-153, adopted by the Board on December 12, 1990.

DISCHARGE DESCRIPTION

5. The treatment plant has an average dry weather flow design capacity of 5.2 million gallons per day (mgd). The plant presently discharges an average dry weather flow of 4.45 mgd and annual average flow of about 5.16 mgd. The average maximum daily flow during the five year period from 1993 through 1997 was 14.44 mgd. During about 6 months of the year, the plant discharges an average effluent flow of 5.25 mgd to the Petaluma River; during the other 6 months the plant reclaims an average flow of 2.96 mgd (effluent, 1997). A map showing the location of the facility is included as Attachment A.

6. During the period from October 21 through April 30, treated wastewater is discharged into the Petaluma River through a submerged diffuser located approximately 100 feet offshore and is 8.6 feet

below MLLW level. The location of the outfall is approximately Latitude: 38° 12' 33" and Longitude: 122° 34' 22".

7. From May 1 through October 20, treated wastewater is reused for agricultural irrigation. Discharge to the river does not occur during this period except as authorized by this permit, and only after a request, which may be submitted over the telephone, is made to the Executive Officer and the Executive Officer approves it. This report must fully explain the need for discharges during this period (e.g., high flows related to late spring or early fall storm events, when reclamation is not feasible). Discharges of treated wastewater to land are regulated by Wastewater Reclamation Requirements in Order No. 88-036, adopted by the Board on March 16, 1988. In addition to agricultural irrigation, treated wastewater is applied to a golf course located at Frates Road and Ely Road on a year round basis. A General Permit for water reuse in the San Francisco Bay area, issued January 17, 1996, is also applicable to the reclamation project.

TREATMENT PROCESS DESCRIPTION

8. The treatment facility is divided between the main plant located at 950 Hopper Street in Petaluma and the oxidation ponds located approximately 2.5 miles southeast of the plant, along Lakeville Highway. The treatment process consists of rag and grit removal, pre-aeration, primary sedimentation, biological treatment (either biofiltration or activated sludge), secondary clarification, oxidation lagoon treatment, followed by chlorination/dechlorination. The lagoon / oxidation pond treatment system consists of aeration and oxidation in a 162 acre pond system. Sludge is treated by anaerobic and aerobic digestion , dewatered by either centrifuge or belt filter press, and disposed of to a landfill. A treatment process schematic diagram is included as part of this Order.

9. At the headworks of the treatment plant on Hopper Street, wastewater is screened prior to being pumped to the aerated grit removal chamber. Grit is augered to a dumpster for disposal at a landfill. Following grit removal, wastewater flows to a primary clarifier.

10. Flows greater than 4.0 mgd are sent directly from the primary clarifiers to the pond system. Flows less than 4.0 mgd are split between two secondary treatment processes. Up to 2.2 mgd is treated in a biofiltration system consisting of three trickling filters in series, and up to 1.8 mgd is treated in an activated sludge process. Flows from the trickling filters and the activated sludge process are directed to secondary clarifiers and then pumped to the oxidation pond system.

11. *Wet Weather Flow Handling.* Daily flows in excess of 6.0 mgd are pumped directly from the Pond Influent Pump Station, after rag removal in a screening unit, to the oxidation pond system for treatment.

12. *Oxidation ponds.* The oxidation pond system consists of an aerated lagoon followed by an aerated pond and nine oxidation ponds. In order to optimize the pond system to achieve the highest quality of effluent, the number of ponds used for treatment at any given time may vary, depending on the time of year, flows, and weather conditions. The aerated lagoon has 3 aerators and pond #1 is equipped with 7 aerators. Effluent from these ponds is disinfected by chlorination.

13. In order to enhance the reliability of the existing treatment plant, the discharger has recently added additional aerators to the oxidation ponds as well as finer screening at the headworks and bar screens at the Pond Influent Pump Station.

14. *Sludge Handling and Disposal.* Wastewater solids removed during the treatment process are directed to either anaerobic or aerobic reactors for digestion. Waste activated sludge from the activated sludge process goes to the aerobic digester, while sludge from the biofiltration system and primary clarifier go to the anaerobic digester. The sludge is then dewatered by either a belt filter press or centrifuge. Stabilized, dewatered biosolids are hauled away for off-site disposal to a landfill.

15. *Effluent Flow and Monitoring.* From October 21 to April 30, effluent from the oxidation ponds is dechlorinated prior to discharge to the Petaluma River. From May 1 through October 21, treated wastewater is reclaimed for irrigation. Flows directed to the reclamation project are chlorinated, but generally not dechlorinated. Plant effluent flow is diverted either directly to the reclamation distribution system or to the outfall pipeline which extends 100 feet to the Petaluma River discharge point. Effluent is monitored just after entering the pipelines. Total plant effluent flow and flow to reclamation are measured separately.

16. General quality of the effluent discharged from the plant during 1995 through 1997, based on information provided in the application and self-monitoring reports, is as follows:

Constituents	Average
Biochemical Oxygen Demand, mg/L	14.74
Suspended Solids, mg/L	33.20
Settleable Matter, ml/L/hr	<0.1

COLLECTION SYSTEM DESCRIPTION

17. *Collection system and pump stations.* The discharger's existing sanitary sewer collection system comprises approximately 220 miles of public sewer pipelines ranging in diameter from 6 to 48 inches. The collection system also includes four primary sewage pump stations: C Street, Wilmington, Payran, and Copeland Street. These pump stations have alarms for notification in the event of system failure, and provision for emergency power.

18. Wastewater collection systems are subject to increased flows during wet weather due to rainfall induced infiltration and inflow. The Basin Plan states that, depending upon the levels of water quality protection required, collection systems should be evaluated to contain various recurrence interval stormflow. In a Sewer System Infiltration/Inflow Study, dated May 1996, overflow problems in the collection system were determined to be primarily a result of limitations in the pumping capacity at the Pond Influent Pump Station (PIPS), which conveys treated effluent from the wastewater treatment facility to the oxidation ponds. To meet current and future peak wet weather flows and avoid overflows in the sewer collection system, the discharger has instituted a Capital Improvement Program to upgrade the PIPS by expanding its pumping capacity. Completion of this plant upgrade is planned for the Fall of 2000.

19. The recent addition of weirs at the headworks and an automatic screening system at the PIPS have altered the plant influent flow by increasing influent loadings to the pond system, where additional aerators have also been recently added to improve the oxidation pond treatment. These alterations were designed to help protect the existing treatment facilities during high wet weather flows and improve treatment capability. The discharger also plans to replace a portion of the Lindberg Lane trunk sewer to increase capacity in the system. Other, smaller scale sewer maintenance and improvement projects are also underway. Implementation of these projects will improve the system's ability to handle peak flows.

FUTURE PLANNING

20. The current wastewater treatment facilities consist of a combination of facilities that were constructed at various stages of community development over the past 60 years. The trickling filter plant was constructed in 1938, and the activated sludge plant was built in 1966. The oxidation ponds were added in 1972. Many treatment units, along with other equipment at the site, have exceeded their design life. These units and other mechanical, electrical and structural components of the plant may be subject to future break down and may need costly upgrade and repairs. Also, flows at the plant are reaching the permitted capacity of the facility.

21. In order to address the above described concerns, in 1991, the discharger initiated a planning process for evaluation of the existing facilities, and development of a new plant. An Environmental Impact Report for the City of Petaluma's Wastewater Facilities Project and Long-Range Management Program were approved by the Petaluma City Council in June of 1996.

22. The discharger is currently in the process of evaluating design options for a new tertiary facility with an average dry weather flow of 6.7 mgd. The new facility will replace the existing facility. Once the new facility begins operating, the treatment structures at 950 Hopper Street will be demolished with the exception of the Pond Influent Pump Station. This permit will need to be amended to provide information on design and operation of the new facility.

APPLICABLE PLANS, POLICIES AND REGULATIONS

23. *Basin Plan.* The Board adopted a revised Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan) on June 21,1995. This updated and consolidated plan represents the Board's master water quality control planning document. The revised Basin Plan was approved by the State Water Resources Control Board (SWRCB) and the Office of Administrative Law on July 20, 1995 and November 13, 1995, respectively. A summary of the regulatory provisions is contained in Title 23 of the California Code of Regulations, Section 3912. The Basin Plan identifies beneficial uses and water quality objectives for waters of the state in the Region, including surface waters and groundwaters. The Basin Plan also identifies effluent limitations and discharge prohibitions intended to protect beneficial uses. This Order implements the plans, policies and provisions of the Board's Basin Plan.

BENEFICIAL USES

24. The beneficial uses identified in the Basin Plan for the Petaluma River are:

- Cold Fresh Water habitat
- Marine Habitat*
- Fish Migration
- Navigation
- Preservation of Rare and Endangered Species
- Water Contact Recreation
- Noncontact Water Recreation
- Fish Spawning
- Warm Freshwater Habitat
- Wildlife Habitat

* The discharger may petition the Board to change this beneficial use to "estuarine" in the Basin Plan review process.

REGULATORY BASIS FOR EFFLUENT LIMITS AND DISCHARGE REQUIREMENTS

25. Effluent limitations in this permit are based on the plans, policies and water quality objectives and criteria of the 1995 Basin Plan, *Quality Criteria for Water* (EPA 440/5-86-001, 1986 and subsequent amendments "Gold Book"), applicable Federal Regulations (40 CFR Parts 122 and 131), National Toxics Rule (57 FR 60848, 22 December 1992; 40 CFR Part 131.36(b), "NTR"), National Toxics Rule Amendment (Federal Register Vol. 60, No. 86, 4 May 1995 pg. 22229-22237), and best professional judgment as defined in the Basin Plan. Where numeric effluent limitations have not been established in the Basin Plan, 40CFR122.44(d) specifies that water quality based effluent limits may be set based on USEPA criteria and supplemented where necessary by other relevant information to attain and maintain narrative water quality criteria to fully protect designated beneficial uses.

U.S. EPA guidance documents upon which best professional judgment (BPJ) was developed may include in part:

- Technical Support Document for Water Quality Based Toxics Control March 1991,
- Region 9 Guidance For NPDES Permit Issuance February 1994,
- Policy and Technical Guidance on Interpretation and Implementation of Aquatic Life Metals Criteria October 1, 1993,
- Whole Effluent Toxicity (WET) Control Policy July 1994,
- Draft National Guidance for the Permitting, Monitoring, and Enforcement of Water Quality-based Effluent Limitations set Below Analytical Detection/Quantitation Levels March 18, 1994,
- National Policy Regarding Whole Effluent Toxicity Enforcement, August 14, 1995,
- Clarifications Regarding Flexibility in 40 CFR Part 136 Whole Effluent Toxicity (WET) Test Methods, April 10, 1996,
- Interim Guidance for Performance - Based Reductions of NPDES Permit Monitoring Frequencies April 19, 1996,
- Regions 9 & 10 Guidance for Implementing Whole Effluent Toxicity Programs Final May 31, 1996,
- Draft Whole Effluent Toxicity (WET) Implementation Strategy February 19, 1997.
- National Toxics Rule, 57 FR 60848, December 22, 1992 (NTR).

Basis for Existing Limits

26. *Technology Based Limits.* Permit effluent limits for conventional pollutants are technology based and are the same as in the prior permit. These constituents include: Biochemical Oxygen Demand (BOD), total suspended solids, settleable matter, oil and grease, and chlorine residual. Technology-based effluent limitations are based on secondary treatment or treatment equivalent to secondary for trickling filter and oxidation pond facilities meeting the requirements of 40 CFR Part 133.100-133.105.

27. *Marine and Fresh Water Quality Objectives and Limits.* The Petaluma River is tidally influenced in the vicinity of the outfall during most of the discharge season. However, monitoring data from the past several years indicates that there are periods of sustained fresh water flow during the rainy season in normal to wet years. The beneficial uses of the Petaluma River include both fresh and marine habitats. The Basin Plan states that freshwater effluent limitations shall apply to discharges

to receiving waters with salinities less than 5 parts per thousand (ppt) at least 75 percent of the time, while saltwater effluent limitations shall apply to discharges to receiving waters with salinities greater than 5 parts per thousand (ppt) at least 75 percent of the time in a normal water year. The Basin Plan further states that for discharges to waters with salinities in between these two categories or to tidally influenced freshwater that support estuarine beneficial uses, effluent limitations shall be the lower of the marine or freshwater effluent limitation, based on ambient hardness. The 1995 Basin Plan and 1992 NTR include formulas for calculating freshwater aquatic life objectives based on site specific hardness levels. The Petaluma River is tidally-influenced, but is not listed in the Basin Plan as supporting estuarine beneficial uses. The Discharger may perform a study to investigate beneficial uses of the Petaluma River in the vicinity of the discharge and the percentage of time for which salinities are greater or lesser than 5 ppt. However, this Order's effluent limitations are based on the lower of the marine and fresh water quality objectives based on the waters having salinities in between the two categories described above. Freshwater effluent limitations for applicable toxic constituents were evaluated using the formulas in Basin Plan Table 3-4 based on a conservatively derived assumed ambient hardness of 200 mg/L as $CaCO_3$ (not based on actual receiving water data).

28. *Shallow Water Discharge.* Discharge to the Petaluma River is into shallow water, with the diffuser located approximately 100 feet offshore and is 8.6 feet below MLLW level. The actual dilution received by the discharge in the Petaluma River has not been modeled or measured. Due to the tidal nature of the river, and limited upstream fresh water flows, the discharge is classified by the Board as a shallow water discharge. Therefore, effluent limitations are calculated assuming no dilution (D=0).

    The 1995 Basin Plan (p.4-12) states that shallow water dischargers may apply to the Regional Board for exceptions to the assigned dilution ratio of D=0 (and thus the shallow water effluent limitations) based on demonstration of compliance with water quality objectives in the receiving waters and implementation of an aggressive pretreatment and source control program. The cited Basin Plan Shallow Water Discharges section specifies the issues that must be addressed to support requests for the Board to consider granting limited dilution credit where needed to meet effluent limits in the form of revised effluent or mass loading limits.

Basis for Revised Effluent Limits

29. *Water Quality Based Effluent Limitations.* Toxic substances are regulated by water quality based effluent limitations derived from USEPA national water quality criteria listed in the Basin Plan Table 3-3 and 3-4, the National Toxics Rule, or USEPA Gold Book, and/or best professional judgment. Limits for cadmium, copper, mercury, Lindane, and cyanide are more stringent than in the prior permit. Further details about the effluent limitations are given in the associated Fact Sheet, which is incorporated as part of this Order.

30. *Alternative Limits.* The Basin Plan (page 4-8) provides that alternate effluent limitations can be considered by the Board where a site-specific water quality objective is being proposed and the Discharger is participating in source control programs. As stated below (Finding 33.h and 34.e), the Discharger is implementing well-developed source control programs for copper and mercury. It is consistent with this provision of the Basin Plan to use an interim effluent limitation for copper and mercury pending the development of the studies leading up to the Board's consideration of any site-specific recommendations to evolve from those analyses. In addition to interim limits, water quality based effluent limits (WQBEL) are included in this Order. Due to mercury contributing to the impairment of San Pablo Bay and its bioaccumulative effects, a mass limit, in addition to interim and

water quality based concentration limits, is included in this Order. Alternative limits have also been determined for cyanide provided that monitoring and source control programs are implemented. The bases for these alternate limits is presented in the Fact Sheet and Findings 39.

31. a. *Applicable Water Quality Objectives.* The Basin Plan (page 3-4) established a narrative objective for toxicity in order to protect beneficial uses: "All waters shall be maintained free of toxic substances in concentrations that are lethal to or produce other detrimental responses in aquatic organisms". The Basin Plan also directs that ambient conditions shall be maintained until site specific objectives are developed. Effluent limitations and provisions contained in this Order are designed to implement this objective, based on available information.

b. *San Pablo Bay Water Quality.* The draft Section 303(d) List of Impaired Water Bodies and Priorities for Development of Total Maximum Daily Loads for the San Francisco Bay Region, dated March 9, 1998, was approved by the State Board on May 27, 1998. Pollutants contributing to the impairment of San Pablo Bay include mercury, copper, exotic species, diazinon, PCBs, selenium, and nickel.

32. **Reasonable Potential Analysis**

As specified in 40 CFR 122.44(d) (1) (i), permits are required to include limits for all pollutants "which the Director determines are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any State water quality standard." Using the method described in the "Proposed Policy for Implementation of Toxics Standards for Inland Surface Water, Enclosed Bays, and Estuaries in California" (Draft, September 1997), and USEPA guidance documents, Regional Board staff have analyzed the effluent data to determine if the discharges had reasonable potential to cause or contribute to an exceedance of a State water quality standard ("RP Analysis"). In the absence of state-adopted numeric water quality objectives, the RP analysis compares the effluent data with the USEPA's Quality Criteria for Water, 1986 (Gold Book), a limited Regional Board site-specific study for copper, and the Basin Plan objective for tributyltin. The RP analysis conservatively assumed that the effluent would receive no dilution. The results of the Reasonable Potential Analysis are described in this finding and in Section B: Effluent Limitations.

For all parameters that have "reasonable potential" to contribute to an exceedance of a water quality objective, numeric water quality-based effluent limitations (WQBELs) are established. For copper and mercury, WQBELs are established with compliance schedules. If WQBELs for copper and mercury are not revised at the end of 7 years from the date of this permit's reissuance, then the WQBELs, based on US EPA water quality criteria and the Basin Plan objectives, 4.9 and 0.012 µg/L, respectively, will become effective. While site-specific objectives and Total Maximum Daily Loads are being developed, the discharger will be held accountable for maintaining ambient conditions to the receiving water and San Pablo Bay by complying with interim performance based limits. For mercury, the interim numeric effluent limit is based on current treatment plant performance at the 99.7th percentile level.

Review of the 1995-1997 data showed that the toxic constituents present in the discharger's effluent at concentrations greater than the detection limit were arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, zinc, cyanide, and several organic compounds, including PAHs, lindane (γ-BHC), α-BHC, pesticides (Dieldrin and Aldrin), halomethanes, chloroform, toluene, and phenols. Of these constituents, only cadmium, chromium, copper, lead, mercury, nickel, PAHs and Lindane

have reasonable potential to cause or contribute to exceedance of water quality objectives based on the RP analyses. All of the other toxic constituents were found at levels well below the corresponding effluent limitations; i.e. based on continued consistent plant performance, arsenic, selenium, silver, zinc, halomethanes, chloroform, toluene, and phenols did not show reasonable potential to cause or contribute to exceedance of applicable water quality objectives. For cyanide, reasonable potential could not be determined due to possible analytical interferences. Therefore, an interim performance-based limit is established until more information is available to perform a justifiable reasonable potential analysis. Also, for the toxic constituents, α-BHC, Dieldrin, and Aldrin, which have only been detected in the effluent one time each during 1995 through 1997, reasonable potential could not be conclusively determined due to data validation and detection level issues. Consequently, this Order requires increased monitoring for these constituents. Also, alternative analytical techniques shall be used as they become available.

The limit for PAHs, as defined by the Basin Plan, is the sum of about sixteen constituents measured in USEPA Method 610. The NTR, which is based on more updated data, list standards for just eleven of the PAHs measured in Method 610. The USEPA criteria for three of the eleven are higher than the other eight; these are anthracene (NTR objective at 110,000 ppb), fluorene (14,000 ppb), and pyrene (11,000 ppb). Therefore, the PAH objectives in the current permit are for the other eight PAHs that may be present in the discharge at concentrations which pose a reasonable potential to contribute to water quality impacts. The USEPA criteria for each of these eight PAHs are 0.049 ppb based on updated cancer potency factors (q*) from USEPA's Integrated Risk Information System (IRIS). However, since current detection levels are not able to measure these PAHs at this low level, these limits cannot be enforced. Therefore, the limit for these eight PAHs is set at the practical quantitation level (PQL), or five times the method detection level. The eight PAHs are listed in Provision 13 of this Order and in Footnote 7, Table 1A, of the SMP.

The water quality objectives (WQO) that had reasonable potential to be exceeded, and the projected maximum concentrations (PEQ) computed from the analyses are listed in the following table for each constituent analyzed. The PEQ was computed based on concentration data measured during discharge periods from 1995 through 1997. No dilution was used in the determination. If the projected maximum concentration is greater than the WQO, then there is reasonable potential for that constituent to cause or contribute to exceedance of the objective.

Constituent	PEQ (99%) (µg/L)	WQO (µg/L)	Reasonable Potential
Copper	24.7	4.9	yes
Mercury	0.82	0.012	yes
Lead	7.5	5.6	yes
Cadmium	2.5	2	yes
Chromium	11.4	11	yes
Nickel	17.6	7.1	yes
Lindane	0.94	0.16	yes
PAHs	61.6	0.049	yes
Arsenic	16.2	20	no
Silver	0.85	2.3	no
Zinc	33.6	58	no
Selenium	1	5	no

The Board cannot determine whether several organic constituents (PCBs, semi-volatile and volatile organics) have the reasonable potential to cause or contribute to exceedance of applicable water quality objectives because the historical effluent limitations were lower than current analytical techniques can measure. The Discharger will continue to monitor for these constituents and to implement new methodologies which lower the detection limits as they become available. If detection limits improve to the point where it is feasible to evaluate compliance with the water quality objectives, a new reasonable potential analysis would be conducted to determine whether there is need to add numeric effluent limits to the permit or to continue monitoring.

A reopener provision is included in this Order that allows numeric limits to be added to the permit for any constituent that in the future exhibits reasonable potential to cause or contribute to exceedance of applicable water quality objectives. This determination, based on monitoring results, will be made by the Board.

33. **Total Maximum Daily Load**

For pollutants, such as copper and mercury, that have interim performance-based limits based on the reasons stated above, the Board intends to establish different WQBELs after intensive literature review and data collection to determine appropriate local water quality objectives and cost-effective measures to achieve these objectives. Based on the final Water Quality-Limited Waterbodies (303(d)) list, the Board may adopt Total Maximum Daily Loads (TMDLs) which may result in revising the WQBELs established in this Order. The Board's plan for conducting these reviews, data collection and potentially developing TMDLs will be prioritized in the final 303(d) list and incorporated into the Watershed Management Initiative for implementation.

The following summarizes the Board's strategy to collect water quality data and general approaches to policy and TMDL development with associated time frames, and funding mechanism for this work:

- Data collection - The Board will require individual point and non-point discharger or dischargers collectively to develop analytical techniques capable of detecting these pollutants at levels of concern and to characterize loadings from their facilities into the water quality-limited waterbodies. The results will be used to (1) revise the 303(d) list (2) support the watershed-specific pollutant policy development.

- Policy and TMDL development - A draft region-wide Mercury TMDL has been prepared by the Board staff which will be distributed for public review and comment in summer 1998. Adoption of the Mercury TMDL will be considered by the Board as part of the Basin Plan triennial review in 1998. This process will refine the timing and mechanism for development of other pollutant-specific TMDLs.

- Funding mechanism - The Board anticipates receiving resources from federal agencies for development of any alternate water quality based limits. The Board intends to supplement these resources to ensure timely alternate limits by allocating development costs among all dischargers through Regional Monitoring Program (RMP) or other appropriate group funded mechanisms. The Discharger has shown a willingness to participate in such a Board-initiated group effort as long as criteria are established to allocate the costs among all dischargers in the watershed equitably.

34. Copper

a. *Copper Water Quality Objectives.* In 1984 the USEPA promulgated a national saltwater and freshwater copper criterion of 2.9 µg/L, measured as total recoverable copper. The Board developed a proposed Bay-wide site specific water quality objective for copper for San Francisco Bay of 4.9 µg/L in 1991. The site specific objective for copper employed the "water effect ratio" (WER) approach developed by the USEPA. This approach provides a measure of the binding capacity of natural waters (dependent on particulate matter) relative to the binding capacity of reference waters (filtered oceanic water). In the best professional judgment of the Board, from a technical standpoint, the Bay-wide site-specific objective was protective of the most sensitive designated beneficial use of San Francisco Bay water with respect to copper: habitat for aquatic organisms. The study and associated staff analysis are described in a September 25, 1992 Board staff report entitled "Revised Report on Proposed Amendment to Establish a Site Specific Objective for Copper for San Francisco Bay".

b. The Board amended the Basin Plan on October 21, 1992 to include the site specific water quality objective of 4.9 µg/L for copper for San Francisco Bay based on a Bay-wide WER of 1.7 and the criterion of 2.9 µg/L. On June 16, 1993, the Board amended the 1986 Basin Plan to incorporate a wasteload allocation for copper. On April 21, 1994 the State Water Resources Control Board remanded both of these Basin Plan amendments as a consequence of the court decision which invalidated the California Enclosed Bays and Estuaries Plan and Inland Surface Waters Plan. Therefore, neither the site specific water quality objective nor the wasteload allocation have been legally promulgated.

c. On October 1, 1993, in recognition that the dissolved fraction may be a better representation of the biologically active portion of the metal than is the total or total recoverable fraction, the USEPA Office of Water recommended that State water quality standards for the protection of aquatic life (with the exception of chronic mercury criterion) be based on dissolved metals. USEPA amended the NTR in 1995 to include factors to convert total metals to dissolved metals for both fresh and salt water objectives. USEPA published guidance in June 1996 on using metal translators, derived from site specific receiving water data, to calculate total recoverable effluent limits necessary to achieve dissolved receiving water criteria.

d. In 1996, the USEPA promulgated a revised national saltwater dissolved copper criteria of 3.1 µg/L. This revised criteria incorporates new scientific data generated during site specific studies of both New York Harbor and the San Francisco Bay. In order for the Board to consider application of the dissolved criteria to the discharge, an appropriate translator based on effluent and receiving water data must be developed. This Order requires the discharger to conduct a study to generate data that may be considered by the Board for translation of the dissolved criteria to a total recoverable effluent limit.

e. This Order establishes an interim performance-based effluent limitation for copper, as well as a water quality based effluent limit with the time schedule specified in Provision 3. When additional site specific information is available that would allow derivation of an appropriate limit that considers the binding capacity of the receiving waters, a different water quality based effluent limit may be established by the Board. This information may be developed by the discharger, the Regional Board, and/or other parties. The discharger is required to implement a testing program that could lead to development of a site specific objective for copper for the Petaluma River. The discharger shall also report mass emissions of copper each month on a

year-round basis from both their influent and effluent. This data shall be used to develop a mass-emission study as part of a region-wide TMDL effort for copper.

f. This Order establishes an interim performance based limit for copper applicable to the discharge. The interim performance based effluent limit for copper is based on the 99.7th percentile of plant performance during the period 1995 through 1997. The Board may revise or amend this permit to apply a new limit that reflects up-to-date performance. This interim limit will be solely for the purposes of this permit. A different water quality based effluent limitation, other than the 4.9 µg/L established in this Order, may be included in a subsequent permit revision after additional information on such factors as attainability, impacts on beneficial uses, and site specific limits is developed.

g. *Copper Effluent Concentrations.* Total recoverable copper concentrations measured in the discharger's effluent during the five year period from January 1992 through December 1996 have ranged from 1.2 to 15 µg/L. Effluent concentrations from years 1996 and 1997 ranged from 2 to 7 µg/L and 2 to 5 µg/L, respectively. This reduction is likely the result of copper corrosion control efforts implemented by the Sonoma County Water Agency.

h. *Copper Reduction Program.* The process for development of a revised water quality based limit for copper may result in the establishment of a limit that is lower than the plant is currently able to achieve. If the final water quality objective for copper is based on the national dissolved criteria, it will be important to also consider protection of beneficial uses that could be impacted by particulate copper. Due to the uncertainties about the quantities of copper that could be a stress to the ecosystem, particularly in mediums other than the water column (such as sediments, and/or organisms that take in particulate matter), the discharger is required to continue to participate in efforts to reduce influent copper concentrations. Continued implementation of the discharger's source control program will also provide information that can be used to assess the discharger's ability to comply with a new water quality based limit.

35. Mercury

a. *Mercury Water Quality Objectives.* For mercury, the national chronic criterion is based on protection of human health. The criterion is intended to limit the bioaccumulation of methyl-mercury in fish and shellfish to levels which are safe for human consumption. As described in the Gold Book, the fresh water criterion is based on the Final Residual Value of 0.012 µg/L derived from the bioconcentration factor of 81,700 for methyl mercury with the fathead minnow, which assumes that essentially all discharged mercury is methylmercury. The saltwater criterion of 0.025 µg/L was similarly derived using the bioconcentration factor of 40,000 obtained for methylmercury with the Eastern oyster. These criteria are below levels that have produced acute and chronic toxicity in both fresh and salt water aquatic species.

b. *Mercury Compliance.* Effluent mercury concentrations measured during 1997 ranged from 0.01 to 0.06 µg/L . Although these concentrations were in compliance with the effluent limitation of 1.0 µg/L, this limit is no longer considered to be protective of beneficial uses. Therefore, although the discharger has been out of violation only once (a data outlier due, possibly, to laboratory error), their effluent has exceeded the national fresh water criterion of 0.012 µg/L on 6 out of the 12 sampling occasions. During the five year period from January 1992 through December 1996, effluent concentrations were in excess of the objective on 22 out of 43 sampling occasions, with concentrations ranging from 0.01 to 1.6 µg/L. Detection limits were not low

enough, however, to determine actual effluent concentrations on 15 out of 43 occasions. Through improved (ultra-clean) sampling and analysis techniques, the detection limit for mercury has dropped below the 0.012 µg/L objective. Although recent sampling (1996 and 1997) indicates a decrease in the annual average concentration, data from the past several years is cause for concern about the discharger's ability to comply with an effluent limit based on the 0.012 µg/L national objective.

c. *Special Studies and Schedules.* Board staff are in the process of developing a plan to address mercury compliance for north bay shallow water dischargers, including the City of Petaluma. Review of recent data indicates that in the absence of dilution credit (as allowed for deep water dischargers) the discharge concentrations for these facilities are all generally higher than the objectives. There is uncertainty as to the discharger's ability to reduce mercury effluent concentrations through source control efforts. As such, it may be appropriate to apply a mass loading limit to these dischargers, and focus mercury reduction efforts on more significant and controllable sources. Although the municipal dischargers are generally not considered to be significant contributors to the bulk mercury loading to the San Francisco Bay, there does remain the possibility of localized impacts related to their discharges. As such, the discharger is required to maximize their control over influent mercury sources, with consideration of relative costs and benefits. The discharger is encouraged to continue working with other shallow water dischargers to optimize both source control efforts and assessment of alternatives for protecting beneficial uses of receiving waters.

d. *Mercury Limits.* This Order establishes an interim performance-based effluent limit for mercury as well as a water quality based effluent limit (WQBEL) with a compliance schedule. The interim effluent limitation for mercury is based on the 99.7th percentile of plant performance from February 1996 through December 1997. The reason for looking at only the last two years of data is due to the previously high detection limits, which ultra-clean sampling and analytical techniques have lowered. Also, the significantly high concentration measured in January 1996 (1.6 µg/L) was considered an outlier and was not included in the data set. This interim limit will be solely for the purposes of this permit. The WQBEL of 0.012 µg/L is established in this Order according to the compliance schedule specified in Provision 4. A different water quality based effluent limitation may be included in a subsequent permit revision after additional information on such factors as attainability, impacts on beneficial uses, and site specific limits is developed. In addition to the performance-based limit and WQBEL with a time schedule, a mass-based annual limit and a mass loading monthly maximum for mercury are established in this Order. The mass loading monthly maximum (or "trigger") initiates additional actions as specified in Provision 5 and was based on the highest calculated 12-month moving average load using discharge flows and concentrations from ultra-clean sampling and analysis techniques. The mass based annual limit was calculated from 12-month moving average flows during the entire year and concentrations from the last three years.

e. *Source Control.* This Order requires the discharger to develop and implement a source control program as necessary to comply with, or evaluate their ability to comply with a 0.012 µg/L limit, and to reduce any significant, controllable sources that may be contributing to mercury toxicity in the receiving waters. The Regional Board intends to work toward the derivation of mercury effluent limitations for the north bay dischargers, that will lead towards overall reduction of mercury mass loadings in the watershed. This permit will be revised after additional information on such factors as attainability, impacts on beneficial uses, mass loadings, and site specific limits is developed. This permit contains a time schedule for the mercury source control program. The

discharger will also participate in watershed based activities and studies, as directed by the Regional Board staff, that are aimed at mercury source identification and reduction. Based on these studies, the Board may amend this permit to specify a different limit for mercury.

36. Coliform

a. *Total and Fecal Coliform.* The Basin Plan specifies water quality objectives for both total and fecal coliform and, to date, the effluent limitation has been based on total coliform. The Basin Plan (Table 4-2, footnote "d") allows the Regional Board to substitute fecal coliform limits for total coliform limits, provided that it can be conclusively demonstrated through a program approved by the Regional Board that such a substitution will not result in unacceptable adverse impacts on the receiving waters. This Order specifies a total coliform limit (as in the previous permit), but allows the discharger to conduct a study to evaluate the feasibility of utilizing an effluent limit based on the fecal coliform objective. If the discharger can demonstrate, to the satisfaction of the Executive Officer, that the use of fecal coliform limits will not impair the beneficial uses of the receiving waters, then the fecal coliform limit specified as an alternative under the Effluent Limitations section shall apply to the discharge. If necessary, based on the results of the study, this permit may be amended to include a fecal coliform limit.

37. Chronic Toxicity

a. *Program History.* The Basin Plan contains a narrative toxicity objective stating that "All waters shall be maintained free of toxic substances in concentrations that are lethal to or produce other detrimental responses to aquatic organisms" and that "there shall be no chronic toxicity in ambient waters." The Board initiated the Effluent Toxicity Characterization Program (ETCP) in 1986 with the goal of developing and implementing toxicity limits for each discharger based on actual characteristics of both receiving waters and waste streams. Two rounds of effluent characterization were conducted by selected dischargers beginning in 1988 and 1991. A second round was completed in 1995, and the Board is evaluating the need for a third round. Board guidelines for conducting toxicity tests and analyzing results were published in 1988 and last updated in 1991.

Attempts have been made to include numeric chronic toxicity limits in NPDES permits. The Board adopted Order No. 92-104 in August 1992 amending the permits of eight dischargers to include numeric chronic toxicity limits, based on an eleven sample median value of 1 TUc and 90th percentile value of 2 TUc. However, due to the court decision which invalidated the California Enclosed Bays and Estuaries Plan and Inland Surface Waters Plan, on which Order No. 92-104 was based, the SWRCB stated, by letter dated November 8, 1993, that the Regional Board will have to reconsider the order. This letter also committed to providing the regional boards with guidance on issuing permits in the absence of the State Plans (*Guidance for NPDES Permit Issuance,* February 1994).

b. *SWRCB Toxicity Task Force Recommendations.* The Toxicity Task Force provided several consensus-based recommendations in their October 1995 report to the SWRCB for consideration in redrafting the State Plans. A key recommendation was that permits should include narrative rather than numeric limits. The numeric test values should then be used as toxicity "triggers" to first accelerate monitoring and then initiate Toxicity Reduction Evaluations (TREs).

c. *Regional Board Program Update*. The Board intends to reconsider Order No. 92-104 as directed by the SWRCB, and to update, as appropriate, the Board's Whole Effluent Toxicity (chronic and acute) program guidance and requirements. This will be done based on analysis of discharger routine monitoring and ETCP results, and in accordance with current USEPA and SWRCB guidance. In the interim, decisions regarding the need for and scope of chronic toxicity requirements for individual dischargers will continue to be made based on best professional judgment as indicated in the Basin Plan.

d. *Discharger Monitoring Results.* The discharger participated in the second round of ETCP screening and variability testing in 1992 and 1993. Of six species tested in the screening phase, the *Selenastrum capricornutum* (a freshwater algae) was found to be the most sensitive to the effluent. *Mysidopsis bahia* (a marine invertebrate) was also sensitive to the effluent with effects on fecundity at 100% effluent. During variability phase testing conducted with *Selenastrum capricornutum*, continued toxicity was observed. Efforts to identify the cause of the toxicity resulted in the conclusion that the hardness and/or conductivity in the effluent was the likely cause of toxicity. This problem was also encountered by other dischargers using this species for testing.

e. *Permit Requirements and Reopener.* In accordance with USEPA guidance, this Order includes the Basin Plan narrative toxicity objective as a chronic toxicity limit, implemented via monitoring. Numeric test values will be used as toxicity "triggers" to initiate accelerated monitoring and perform a chronic toxicity reduction evaluation (TRE). If significant non-artifactual toxicity is consistently detected and the discharger fails to aggressively implement all reasonable control measures included in the TRE workplan, the Board will consider amending the permit to include numeric toxicity limits. The Self-Monitoring Program identifies the species to be used for testing.

38. Total Suspended Solids

a. The physical and operational characteristics of the oxidation ponds may contribute to suspended solids in the final effluent, as clay particles from the pond base are suspended by wave action. Algae growth and daphnia also contributes to suspended solids. The Federal Secondary Treatment [40 CFR 133.103] regulations recognize the inability of waste stabilization ponds to consistently meet standard secondary treatment requirements, and therefore allow alternative limitations when they are consistent with proper operation and maintenance of the facility. According to the Federal Secondary Treatment regulations, these alternative limits may only be applied if (1) the BOD and TSS effluent concentrations, consistently achievable through proper operation and maintenance of the treatment works, exceed the minimum level of the effluent quality set forth in 133.102(a) and 133.102(b); and, (2) waste stabilization ponds or trickling filters are the principal process used for secondary treatment.

b. The secondary treatment processes include the trickling filters, activated sludge unit, and oxidation ponds. The trickling filters and oxidation ponds, together, treat over 50% of the wastewater. However, the BOD effluent quality is not compromised by the ponds or the trickling filters.

c. The effluent limits specified in this Order for total suspended solids are higher than those typically applied to discharge of secondary treated wastewater. These limits were established by the Board upon issuance of the discharger's permit in 1985, based on changes in pond operation

that resulted from initiation of the reclamation program. Altering pond levels to accommodate reclamation needs reduced particulate settling, thus increasing suspended solids levels.

d. During the three years from 1995 through 1997, suspended solids concentrations in the discharge ranged from 20.2 to 68.5 mg/L during the winter discharge season. The average of the monthly-averaged values over this period was 33.2 mg/L. Effluent TSS concentrations exceeded the monthly average limits 2 times during the discharge season of this 3-year period. Based on this data, the discharger would currently be unable to consistently comply with the standard secondary limits for total suspended solids. Although elevated suspended solids may result from suspension of clay particles from the pond bottoms, erosion of the pond levees, and/or algae growth (rather than inadequate wastewater treatment), the impacts of the discharge under the limits established in the earlier permit are uncertain.

e. *Permit Requirements*. This Order requires the discharger evaluate options for reducing suspended solids. Thus, the alternative limits specified in this Order are applicable based on performance of special studies under Provision 9. Although the alternative limits for effluent TSS concentrations apply in this Order, percent removal of TSS remains at 85% as in the previous permit. It is recognized, however, that during wet weather flows, 85% removal of TSS may be difficult to achieve all of the time.

39. Cyanide

The prior permit contains a daily average effluent limit for cyanide of 25 µg/L based on Basin Plan Table 4-3. The saltwater objective for cyanide is 1 µg/L as a 1-hour average. However, the detection limit for weak acid dissociable cyanide is generally 5 µg/L. Effluent cyanide concentrations during 1995-1997 averaged 4.3 µg/L, with a range from <3 µg/L to 10 µg/L. Since influent cyanide concentrations are generally below detection limits, effluent chlorination appears to be creating cyanide or compounds that are also detectable by cyanide analyses (positive interferences). The discharger will investigate potential analytical interferences, in-plant sources of cyanide and potential reduction measures as cited in the Provisions.

Uncertainty also exists as to the persistence of cyanide in the environment. The Basin Plan (page 4-70, Footnote f.) states that "the Regional Board will consider information on the persistence of cyanide in evaluating alternate limit proposals". Therefore, this Permit contains an interim performance-based effluent limitation for cyanide of 14 µg/L (daily average), based on 99.7% of 1995-1997 plant performance. This interim limit will be solely for the purposes of this permit. A final water quality based effluent limitation will be included in a subsequent permit revision after additional data is obtained. The discharger will investigate potential analytical interferences, in-plant sources of cyanide and potential reduction measures as cited in the Provisions.

40. Lindane

This permit establishes a water quality based effluent limit for Lindane (γ-BHC) of 0.16 µg/L. Lindane has been detected six times between 1993 and 1997; concentrations ranged from 0.02 to 0.23 µg/L, and averaged 0.12 µg/L. Due to the limited knowledge surrounding this constituent and the difficulty which the City's plant may have in complying with the current water quality objective, this provision requires implementation of a monitoring and source control program.

Source Control. This Order requires the discharger to develop and implement an effluent monitoring and source control program as necessary to comply with, or evaluate their ability to comply with a 0.16 µg/L monthly limit, and to reduce any significant, controllable sources that may be contributing to Lindane in the receiving waters. This permit may be revised after additional information on such factors as attainability, impacts on beneficial uses, mass loadings, and site specific limits is developed. This permit contains a time schedule for effluent monitoring and source control program.

BASIN PLAN DISCHARGE PROHIBITION

41. The Basin Plan prohibits the discharge of any wastewater which has particular characteristics of concern to beneficial uses at any point at which the wastewater does not receive an initial dilution of at least 10:1, or into any nontidal water, dead-end slough, similar confined waters, or any immediate tributaries thereof. Discharge of wastewater to the Petaluma River is contrary to this prohibition, due to the tidal nature of the Petaluma River, and the limited fresh water flows upstream of the outfall. The discharge is classified as a shallow water discharge; therefore, effluent limitations are calculated assuming no dilution.

42. The Basin Plan provides that exceptions to the above prohibition will be considered for discharges where: 1) an inordinate burden would be placed on the discharger relative to beneficial uses protected, and an equivalent level of environmental protection can be achieved by alternate means such as an alternative discharge site, a higher level of treatment, and/or improved treatment reliability; or, 2) the discharge is approved as a part of a reclamation project; or, 3) it can be demonstrated that net environmental benefits will be derived as a result of the discharge.

43. In addition to the criteria stated above for exceptions, the Basin Plan requires that the Board consider the reliability of the discharger's system in preventing inadequately treated wastewater from being discharged to the receiving water, and the environmental consequences of such discharges.

44. The discharger currently reclaims treated wastewater for irrigation of agricultural lands used to grow fodder, fiber, or seed crops, and on lands used for pasture. The discharger also reclaims treated wastewater for irrigation of a golf course, a field located on property owned by the City of Petaluma, and land adjacent to the oxidation ponds where trees have been planted. The dry weather prohibition period is typically May 1 through October 20 of each year. From 1992 through 1996, the discharger reclaimed an average of 49% of its annual average dry weather flow.

45. The discharger's pond system, utilized for both treatment and storage of wastewater, affords the discharger a significant volume of storage capacity that can be used for containment of peak wet weather flows, or for emergency storage in the event of plant upset. The use of these ponds minimizes the possibility of discharge of untreated or partially treated wastewater to the Petaluma River.

46. The Board finds that the water reuse program implemented by the discharger complies with the exception provision of the Basin Plan. The Board hereby grants an exception to the discharge prohibition for wet weather discharges to the Petaluma River for a six month period each year. This exception is subject to the following conditions. The discharger shall:

    a. Continue to operate all treatment facilities to assure high reliability and redundancy;

b. Continue to implement a source control program for any regulated chemical constituents that are measured at levels in violation of permit effluent limitations;

c. Continue to implement measures to maintain, repair, and upgrade the existing wastewater facilities so as to ensure continued operation and treatment capability in conformance with permit requirements;

d. Continue progress towards construction of new or upgraded treatment facilities. These facilities are to be designed to ensure adequate capacity for community wastewater needs, and an adequate and reliable treatment process developed with sufficient flexibility and redundancy to provide for compliance with permit requirements as necessary to protect beneficial uses of the Petaluma River.

e. Continue to promote and encourage beneficial reuse of treated wastewater.

STORM WATER

47. Federal Regulations for stormwater discharges were promulgated by the USEPA on November 19, 1990. The regulations [40 Code of Federal Regulations (CFR) Parts 122, 123, and 124] require specific categories of industrial activity (industrial storm water) to obtain a NPDES permit and to implement Best Available Technology Economically Available (BAT) and Best Conventional Pollutant Control Technology (BCT) to control pollutants in industrial stormwater discharges.

48. The State Board adopted a statewide NPDES permit for stormwater discharges associated with industrial activities (NPDES General Permit CAS000001, adopted November 19, 1991, amended September 17, 1992). The General Permit is applicable to municipal wastewater treatment facilities. The discharger filed a Notice of Intent for coverage by the General Permit, and a Stormwater Pollution Prevention Plan has been developed and implemented at the site for storm water flows that are directed to the Petaluma River. All pump stations serving the plant are constructed such that rainfall and stormwater in contact with pump station equipment and/or sewage is self-contained, and flows to the treatment plant.

49. In order to consolidate permits for the facility, storm water flows from the site will henceforth be regulated by this Order, and coverage under the General Permit is terminated. These stormwater flows constitute all industrial storm water at this facility and consequently this Order regulates all industrial storm water discharges at this facility, through continued implementation of the Storm Water Pollution Prevention Plan.

PRETREATMENT PROGRAM

50. The discharger has implemented and is maintaining a USEPA approved pretreatment program in accordance with Federal pretreatment regulations (40 CFR 403) and this Board's Order No. 95-015.

OPERATION AND MAINTENANCE

51. Operations and Maintenance procedures are maintained by the discharger for purposes of providing plant and regulatory personnel with a source of information describing all equipment, recommended operation strategies, process control monitoring, and maintenance activities. In order to remain

useful and relevant, the procedures shall be kept updated to reflect significant changes in treatment facility equipment and operation practices.

CEQA AND PUBLIC NOTICE OF ACTION

52. This Order serves as an NPDES Permit, adoption of which is exempt from the provisions of Chapter 3 (commencing with Section 21100) of Division 13 of the Public Resources Code [California Environmental Quality Act (CEQA)] pursuant to Section 13389 of the California Water Code. The certified EIR for the Wastewater Facility Project and Long Range Management Program was reviewed by the Board. This permit will be amended as the new wastewater facility is designed and built. Mitigation measures planned for future water quality impacts from this new facility are addressed in the EIR and do not pertain to this permit.

53. The discharger and interested agencies and persons have been notified of the Board's intent to reissue requirements for the existing discharge and have been provided an opportunity to submit their written views and recommendations.

54. The Board, in a public meeting, heard and considered all comments pertaining to the discharge.

IT IS HEREBY ORDERED, pursuant to the provisions of Division 7 of the California Water Code and regulations adopted thereunder, and to the provisions of the Clean Water Act and regulations and guidelines adopted thereunder, that the City of Petaluma shall comply with the following:

A. DISCHARGE PROHIBITIONS

1. Discharge of wastewater at any point where it does not receive a minimum initial dilution of 10:1, or into dead-end slough and similar confined waters is prohibited, except as defined below. Based on Findings 41 through 46, an exception to this prohibition is granted for the discharge of treated effluent during the wet weather season, as described in Finding 6 of this Order. Discharge of treated wastewater at a location or in a manner different from that described in the findings of this Order is prohibited.

2. The bypass or overflow of untreated or partially treated wastewater to waters of the State, either at the treatment plant or from the collection system or pump stations tributary to the treatment plant, is prohibited.

3. The average dry weather flow discharge shall not exceed 5.2 mgd. The average dry weather flow shall be determined over three consecutive dry weather months each year.

4. Discharge to the Petaluma River is prohibited during the dry weather period each year, from May 1 through October 20, unless the discharger submits a request, which may be submitted over the telephone to the Executive Officer and the Executive Officer approves it. This report must fully explain the need for discharges during this period (e.g., high flows related to late spring or early fall storm events, when reclamation is not feasible).

5. Discharges of water, materials, or wastes other than storm water, which are not otherwise authorized by this NPDES permit, to a storm drain system or waters of the State are prohibited.

6. Storm water discharge from the facility grounds shall not cause pollution, contamination, or nuisance.

B. EFFLUENT LIMITATIONS

1. The term "effluent" in the following limitations means the fully treated wastewater effluent from the discharger's wastewater treatment facility, as discharged to the Petaluma River. The effluent discharged to the Petaluma River during the wet weather period shall not exceed the following limits:

   Conventional Pollutants Effluent Limitations

Constituent	*Units*	*Monthly Average*	*Weekly Average*	*Daily Maximum*	*Instantaneous Maximum*
Biochemical Oxygen Demand (BOD_5, 20°C)	mg/L	30	45	60	--
Total Suspended Solids	mg/L	45	65	70	--
Settleable Matter	ml/L-hr	0.1	--	--	0.2
Oil & Grease	mg/L	10	--	20	--
Chlorine Residual[1]	mg/L	--	--	--	0.0

[1] Requirement defined as below the limit of detection in standard test methods defined in the latest edition of *Standard Methods for the Examination of Water and Wastewater*.

2. The pH of the discharge shall not exceed 8.5 nor be less than 6.5.

3. Coliform Bacteria: The treated wastewater, at some point in the treatment process prior to discharge, shall meet the following limits of bacteriological quality:

   a. The moving median value for the MPN of total coliform bacteria in any seven consecutive samples shall not exceed 23 MPN/100 mL; and

   b. Any single sample shall not exceed 240 MPN/100 mL.

   The discharger may use alternate limits of bacteriological quality instead of meeting 3.a and 3.b above (total coliform limits) if the discharger can establish to the satisfaction of the Board that the use of the fecal coliform limits will not result in unacceptable adverse impacts on the beneficial uses of the receiving water.

4. 85 Percent Removal, BOD and TSS: The arithmetic mean of the biochemical oxygen demand (Five-day, 20°C) and total suspended solids values, by weight, for effluent samples collected in each calendar month shall not exceed 15 percent of the arithmetic mean of the respective values, by weight, for influent samples collected at approximately the same times during the same period.

5. Acute Toxicity: Representative samples of the effluent shall meet the following limits for acute toxicity: (see Provisions of this Order for more information)

The survival of organisms in undiluted effluent from parallel 96-hour flow-through bioassays shall be an eleven (11) sample median value of not less than 90 percent survival, and an eleven (11) sample 90 percentile value of not less than 70 percent survival. The eleven sample median and 90th percentile effluent limitations are defined as follows:

11 sample median: Any bioassay test showing survival of 90 percent or greater is not a violation of this limit. A bioassay test showing survival of less than 90 percent represents a violation of this effluent limit, if five or more of the past ten or less bioassay tests show less than 90 percent survival.

90th percentile: A bioassay test showing survival of less than 70 percent represents a violation of this effluent limit if one or more of the past ten or less bioassay tests show less than 70 percent survival.

6. Chronic Toxicity: Compliance with the Basin Plan narrative toxicity objective shall be demonstrated according to the following tiered requirements based on results from representative samples of the treated effluent meeting test acceptability criteria and Provision 7:

   a. routine monitoring;
   b. accelerate monitoring after exceeding a three sample median value of 1 TUc(1) or a single sample maximum of 2 TUc;
   c. return to routine monitoring if accelerated monitoring does not exceed either "trigger" in "b";
   d. initiate approved TRE workplan and continue accelerated monitoring if monitoring confirms consistent toxicity above either "trigger" in "b";
   e. return to routine monitoring after appropriate elements of TRE workplan are implemented and toxicity drops below "trigger" levels in "b", or as directed by the Executive Officer.

   (1) A TUc equals 100 divided by the no observable effect level (NOEL). The NOEL is determined from IC, EC, or NOEC values. These terms, their usage, and other chronic toxicity monitoring program requirements are defined in more detail in Attachment A of the Self-Monitoring Program of this Order. Monitoring and TRE requirements may be modified by the Executive Officer in response to the degree of toxicity detected in the effluent or in ambient waters related to the discharge.

7.a. Toxic Substances Effluent Limitations: The discharge of effluent containing constituents in excess of the following limitations is prohibited [a]:

Constituent	Units	Daily Average [b]	Monthly Average [b]
Cadmium	µg/L	2 [f]	
Chromium (VI) [c]	µg/L	11.0	
Copper	µg/L	4.9	
Lead [e]	µg/L	5.6	
Mercury	µg/L		0.012
Nickel	µg/L	7.1	
Lindane	µg/L		0.16
PAHs	µg/L	0.049 [h]	

b. Interim Effluent Limitations: The following interim limits shall apply in lieu of the above limits until the date specified in the time schedule below and according to Provisions 3 and 4 for copper and mercury, respectively.

Constituent	Units	Daily Average [b]	Monthly Average [b]	Time Schedule
Copper	µg/L	14 [g]		July 15, 2005
Mercury	µg/L		0.07 [g]	July 15, 2005
Cyanide [d]	µg/L	14 [g]		July 15, 2003

Footnotes:

a. All analyses shall be performed using current USEPA Methods, as specified in USEPA Water/Wastewater Methods (EPA-600 Series), except that mercury analyses may be performed using USEPA Method 1631. Metal limits are expressed as total recoverable metals.
b. Limits apply to the average concentration of all samples collected during the averaging period (Daily - 24-hour period; Monthly - Calendar month).
c. The discharger may meet the limit for hexavalent chromium as total chromium.
d. The discharger may demonstrate compliance with this limitation by measurement of weak acid dissociable cyanide.
e. Effluent limitation may be met as a 4-day average. If compliance is to be determined based on a 4-day average, then concentrations of four 24-hour composite samples shall be reported, as well as the average of four.
f. Limit for cadmium is based on a fresh water objective that is hardness dependent. Limit shown is calculated for an assumed ambient hardness of 200 mg/L $CaCO_3$.
g. Limits are based on recent plant performance (1995-1997) at the 99.7th percentile and are solely for the purposes of this permit and only for the duration of the permit. The limit for cyanide shall apply until more definitive data is available to perform a reasonable potential analysis. The interim limits in 7.b shall apply for copper and mercury until either different WQBELs are established or the 7-year compliance schedule is over, at which time the limits specified in 7.a shall apply.
h. The water quality based effluent limit for PAHs refers to the limit for each of the eight PAHs listed in Provision 13. Compliance is based on the practical quantitation level (PQL), which is five times the method detection level, or 4.0 µg/L, for each PAH.

8. Until TMDL and WLA efforts for mercury provide enough information to establish a different WQBEL, the discharger shall demonstrate that the current mercury mass loading to the receiving water does not increase by complying with the following:

a) Mass limit: The 12-month moving average annual load for mercury shall not exceed **0.6 kg/year**. This limit was calculated from the highest of the moving average loads taken from moving average flows times the corresponding moving average mercury concentrations during the entire year. Compliance shall also be calculated using moving average flows and concentrations from the entire year (during both discharge and reclamation months).

b) Mass trigger: If the 12-month moving average monthly mass loading for mercury exceeds **0.015 kg/month**, the actions specified in Provision 5 shall be initiated. This load was calculated using the yearly moving average discharge flow (in mgd) times the corresponding moving average mercury concentration from data that only used "ultra-clean" analyses (1996 through 1997). The highest resulting moving average load, in kg per day, was used to calculate the 0.015

kg/month. Compliance shall also be determined based on moving average loads from flows and concentrations during the discharge season only.

These mass limit and "trigger" values will be superseded upon completion of Total Maximum Daily Load and Waste Load Allocation. According to the antibacksliding rule in the Clean Water Act, Section 402(o), the permit may be modified to include a less stringent requirement following completion of a TMDL and waste load allocation, if the bases for an exception to the rule are met.

The mass emission limit (or trigger) for mercury shall be calculated as follows:

Flow = Running average of last 12 months of effluent flow in mgd, measured at E-001-S, prior to reclamation or discharge to the Petaluma River (prior to discharge to the Petaluma River).

Hg Conc. = Running average of last 12 monthly mercury concentration measurements in µg/L corresponding to the above flows, measured at E-001.

Mass emission limit, in kg/year = Flow x Hg Conc. x 1.3815
Mass emission trigger, in kg/month = Flow x Hg Conc. x 0.1151

C. POND SPECIFICATIONS

1. A minimum freeboard of two feet shall be maintained in all ponds at all times. Exceptions to this requirement are allowed when an increase in pond storage capacity is needed just prior to, or during the reclamation season, providing there is no threat of overflow due to storm conditions or otherwise. During these periods when the storage capacity is needed, a freeboard of one foot shall be maintained, and the discharger shall ensure that the higher pond levels do not threaten the integrity of the pond levees.

2. All ponds shall be protected from erosion, washout, and flooding from the maximum flood having a predicted frequency of once in 100 years.

3. The waste shall not cause significant degradation of any ground water so as to impair beneficial uses.

D. RECEIVING WATER LIMITATIONS

1. The discharge of waste shall not cause the following conditions to exist in waters of the State at any place:

   a. Floating, suspended, or deposited macroscopic particulate matter or foam;

   b. Bottom deposits or aquatic growths to the extent that such deposits or growths cause nuisance or adversely affect beneficial uses;

   c. Alteration of temperature, turbidity, or apparent color beyond present natural background levels;

   d. Visible, floating, suspended, or deposited oil or other products of petroleum origin;

   e. Toxic or other deleterious substances to be present in concentrations or quantities which will cause deleterious effects on wildlife, waterfowl, or other aquatic biota, or which render any of

these unfit for human consumption, either at levels created in the receiving waters or as a result of biological concentration.

2. The discharge of waste shall not cause the following limits to be exceeded in waters of the State any one place within one foot of the water surface:

   a. Dissolved Oxygen: 5.0 mg/L, minimum

      The median dissolved oxygen concentration for any three consecutive months shall not be less than 80% of the dissolved oxygen content at saturation. When natural factors cause concentrations less than that specified above, then the discharge shall not cause further reduction in ambient dissolved oxygen concentrations.

   b. Dissolved Sulfide: 0.1 mg/L, maximum

   c. pH: Variation from normal ambient pH by more than 0.5 pH units.

   d. Un-ionized Ammonia: 0.025 mg/L as N, annual median
      0.16 mg/L as N, max.

   e. Nutrients: Waters shall not contain biostimulatory substances in concentrations that promote aquatic growths to the extent that such growths cause nuisance or adversely affect beneficial uses.

3. The discharge shall not cause a violation of any particular water quality standard for receiving waters adopted by the Board or the State Board as required by the Clean Water Act and regulations adopted thereunder. If more stringent applicable water quality standards are promulgated or approved pursuant to Section 303 of the Clean Water Act, or amendments thereto, the Board may revise and modify this Order in accordance with such more stringent standards.

4. Storm Water Discharge

   a. Storm water discharges shall not adversely impact human health or the environment.

   b. Storm water discharges shall not cause or contribute to a violation of any applicable water quality objective for receiving waters contained in the Basin Plan.

E. SLUDGE MANAGEMENT PRACTICES

1. All sludge generated by the discharger must be disposed of in a municipal solid waste landfill, reused by land application, or disposed of in a sludge-only landfill in accordance with 40 CFR Part 503. If the discharger desires to dispose of sludge by a different method, a request for permit modification must be submitted to the USEPA 180 days before start-up of the alternative disposal practice. All the requirements in 40 CFR 503 are enforceable by USEPA whether or not they are stated in an NPDES permit or other permit issued to the discharger.

2. Sludge treatment, storage, and reuse shall not create a nuisance, such as objectionable odors or flies, or result in groundwater contamination.

3. Duty to mitigate: The discharger shall take all reasonable steps to prevent or minimize any sludge use or disposal which has a likelihood of adversely affecting human health or the environment.

4. The discharge of sewage sludge shall not cause waste material to be in a position where it is, or can be carried from the sludge treatment and storage site and deposited in the waters of the State.

5. The sludge treatment and storage site shall have facilities adequate to divert surface runoff from adjacent areas, to protect boundaries of the site from erosion, and to prevent any conditions that would cause drainage from the materials in the temporary storage site. Adequate protection is defined as protection from at least a 100-year storm and protection from the highest possible tidal stage that may occur.

6. For sludge that is applied to the land, placed on a surface disposal site, or fired in a sewage sludge incinerator as defined in 40 CFR 503, the discharger shall submit an annual report to the USEPA and the Board containing monitoring results and pathogen and vector attraction reduction requirements as specified by 40 CFR 503, postmarked February 15 of each year, for the period covering the previous calendar year.

7. Sludge that is disposed of in a municipal solid waste landfill must meet the requirements of 40 CFR 258. In the annual self-monitoring report, the discharger shall include the amount of sludge disposed of, and the landfill(s) to which it was sent.

8. Permanent on-site sludge storage or disposal activities are not authorized by this permit. A report of Waste Discharge shall be filed and the site brought into compliance with all applicable regulations prior to commencement of any such activity by the discharger.

9. Sludge Monitoring and Reporting Provisions of this Board's "Standard Provisions and Reporting Requirements", dated August 1993, apply to sludge handling, disposal and reporting practices.

F. PROVISIONS

1. Permit Compliance

The Discharger shall comply with the limitations, prohibitions, and other provisions of this Order immediately upon adoption by the board. The board may reopen this permit to add numeric limits for any constituent that in the future exhibits reasonable potential to cause or contribute to exceedance of applicable water quality objectives. Requirements prescribed by this Order supersede the requirements prescribed by Order No. 90-153. Order No. 90-153 is hereby rescinded.

2. Copper Reduction Study and Schedule

The discharger shall continue to participate in any further efforts to reduce copper corrosion in the water supply system. The discharger shall document current copper reduction and control activities, evaluate the feasibility of potential enhancements to those activities, and develop and implement a source identification and reduction plan for sources of copper other than the water supply system. This program shall be aimed at taking all reasonable and economical steps to reduce influent copper concentrations and shall be developed and implemented in accordance with the following time schedule. The discharger shall also determine and report mass loading of copper during both the river discharge and reclamation periods. This data shall be determined from both the influent and

effluent and reported in the monthly and annual self-monitoring reports. All reports submitted shall be acceptable to the Executive Officer.

Tasks	Compliance Date
a. The discharger shall submit a report, acceptable to the Executive Officer, documenting efforts made to reduce influent copper concentrations, including, but not limited to, details of past measures taken by the local water agencies to reduce corrosion in the supply system. The feasibility of further optimization of corrosion control shall be discussed. This report may be prepared and submitted in conjunction with other wastewater facilities served by the same water purveyors.	November 1, 1998
b. The discharger shall submit a report, acceptable to the Executive Officer, documenting efforts to identify any other significant copper sources in the community. Assessment of options for source reduction shall be provided for any identified sources. Time schedules for anticipated actions associated with implementing a source reduction plan shall be included.	June 1,1999

3. Copper Translator Study and Schedule

In order to develop information that may be used to establish a water quality based effluent limit based on dissolved copper criteria, the discharger shall implement a sampling plan to collect data for development of a dissolved to total copper translator.. This work shall be performed in accordance with the following time schedule:

Tasks	Compliance Date
a. The discharger shall submit a study plan, acceptable to the Executive Officer, for collection of data that can be used for establishment of a dissolved to total copper translator, as discussed in the Findings. Within 30 days after Executive Officer approval, the discharger shall begin implementation of the study plan. The plan shall provide for consideration of anything that can change the character of the receiving waters, that could affect the relative concentrations of dissolved and total copper. The study must take into account metals partitioning in the receiving waters that may be season specific.	April 1, 1999
b. The discharger shall submit a report, acceptable to the Executive Officer, documenting the results of the copper translator study, which may also include any other site specific information that the discharger would like the Board to consider in development of a water quality based effluent limitation for copper.	October 1, 2001

The Board intends to hold a hearing to consider the results of this study, and any other site specific studies the discharger chooses to conduct, and to determine whether adequate information exists upon which to adopt a different WQBEL from the 4.9 µg/L established in this Order. This permit establishes a water quality based effluent limit of 4.9 µg/L for which compliance will be required within seven years of the effective date of this permit. This limit may be revised in response to site specific objective and TMDL studies to be conducted prior to the final compliance date. If the

TMDL efforts are delayed by either the USEPA, the State Board or the Regional Board, then this seven-year time schedule will be revised and extended up to an additional three years.

4. Mercury Reduction Study and Schedule

The discharger shall use methods which are capable of achieving detection limits as low or lower than 0.01µg/L for total mercury. The discharger shall assess the feasibility of attaining the US EPA national freshwater mercury criterion of 0.012 µg/L as described in the Findings. This evaluation shall consider reductions in mercury effluent concentrations achieved through source control and economically feasible optimization of treatment plant removal efficiency (for both the existing, and proposed new facility). If necessary, alternative control strategies shall be investigated, through participation with the Regional Board and other North Bay shallow water dischargers in identifying cross media watershed-wide sources of mercury impacting the receiving water, and potential control measures. The mercury reduction program shall be developed and implemented in accordance with the following time schedule.

Tasks	Compliance Date
a. Submit a proposed program, acceptable to the Executive Officer, to investigate mercury sources, which shall include 1) quantifying mercury levels at critical locations in the collection system over a period of at least one year, at regular intervals, 2) investigating means of optimizing mercury removal by treatment plant processes, 3) evaluating industrial contributions to mercury loadings, 4) evaluating possible means by which these sources can be reduced, and 5) evaluating alternative analytical methods to provide improved data reporting limits. Discharge from any industries and/or commercial establishments that are likely to contain mercury shall be characterized. This submittal shall include a proposed plan and time schedule for evaluation of source reduction measures.	December 1, 1998
b. Following approval by the Executive Officer or within 60 days of submission of the Study Plan to the Executive Officer, commence work in accordance with the study plan and time schedule submitted pursuant to Task 4.a. All possible sources shall be identified. Any sources of significance shall be evaluated for possible reduction.	February 1, 1999
c. Submit an interim report, acceptable to the Executive Officer, documenting the initial findings of source reduction options, and efforts made to encourage minimization of mercury discharges to the collection system.	October 1, 1999
d. Submit a final report, acceptable to the Executive Officer, documenting the findings of source reduction work and efforts made to minimize mercury in the collection system and treated effluent.	February 1, 2001
e. Develop a pollution prevention plan and time schedule, acceptable to the Executive Officer, based on the results of the report submitted pursuant to Task 4.d.	July 1, 2001

This permit establishes a water quality based effluent limit of 0.012 µg/L for which compliance will be required within seven years of the effective date of this permit. This limit may be revised in response to site specific objective and TMDL studies to be conducted prior to the final compliance date. The Board intends to hold a hearing to consider the results of these studies, and determine

whether adequate information exists upon which to adopt a final concentration or mass based mercury limit. The Board may adopt a revised interim limit, and/or schedules to require the discharger to conduct and/or participate in additional studies necessary to support development of a different limit. (Note: If mercury effluent concentrations are consistently maintained below 0.012 μg/L, these source control tasks are not required.) If the TMDL efforts are delayed by either the USEPA, the State Board or the Regional Board, then this seven-year time schedule will be revised and extended up to an additional three years.

5. Mercury Mass Loading Reduction

If mass loading for Hg exceeds the trigger level specified in B.8 of this Order, then the following actions shall be initiated and subsequent reports shall include but not be limited to the following:

I. Notification: Any exceedance of the trigger specified in Effluent Limitation B.8 shall be reported to the Regional Board in accordance with Section E.6.b. in the Standard Provisions and Reporting Requirements (August, 1993).
II. Identification of the problem: Resample to verify the increase in loading. If resampling confirms that the mass loading trigger has been exceeded, determine whether the exceedance is flow or concentration-related. If the exceedance is flow related, identify whether it related to changes in reclamation, increase in the number of sewer connections, increases in infiltration and inflow (I/I), wet weather conditions, or unknown sources. If the exceedance is concentration-related, identify whether it is related to industrial, commercial, residential, or unknown sources.
III. Investigation of corrective action: Investigate the feasibility of the following actions: • Improving public education and outreach • Reducing inflow and infiltration (I/I) • Increasing reclamation Develop a plan and time schedule, acceptable to the Executive Officer to implement all reasonable actions to maintain mercury mass loadings at or below the mass loading trigger contained in Effluent Limitation B.8.
IV. Investigation of additional prevention measures: In the event the exceedance is related to growth and the plan required under III is not expected to keep mercury loads below the mass load trigger, work with the local planning department to investigate the feasibility and potential benefits of requiring water conservation, reclamation, and dual plumbing for new development.

6. Compliance with Acute Toxicity Effluent Limitation

Compliance with Effluent Limitation B.5 (Acute Toxicity) of this Order shall be evaluated by measuring survival of test fish exposed to undiluted effluent for 96 hours in flow-through bioassays. The species to be used is identified in the Self-Monitoring Program.

The discharger shall conduct a special study to measure survival of rainbow trout exposed to undiluted combined effluent. These tests can be conducted using either flow-through or static renewal bioassays. The survival of three-spine stickleback, fathead minnow, and rainbow trout should be measured concurrently, by conducting one test per month for four months during the discharge period. The discharger shall submit test data acceptable to the Executive Officer, within 1 year after adoption of this Order. The Executive Officer shall specify the fish to be used for testing, depending upon the outcome of the screening tests.

All bioassays shall be performed according to protocols approved by the USEPA or State Board, or published by the American Society for Testing and Materials (ASTM) or American Public Health Association. The discharger is allowed to continue using the current test protocols until further guidance is provided by SWRCB or Board staff on conducting the new tests and interpreting the compliance results compared to current test results.

7. TRE for Chronic Toxicity

If there is a consistent exceedance of either of the chronic toxicity monitoring triggers, the discharger shall implement a TRE in accordance with a TRE work plan acceptable to the Executive Officer. The TRE shall be initiated within 15 days of the date that consistent exceedance is found to exist. TREs need to be site specific but should follow USEPA guidance and be conducted in a step-wise fashion. Tier I includes basic data collection, followed by Tier 2 which evaluates optimization of the treatment system operation, facility housekeeping, and the selection and use of in-plant process chemicals.

If unsuccessful in reducing toxicity, Tier 3, a Toxicity Identification Evaluation (TIE) should be initiated and all reasonable efforts using currently available TIE methodologies employed. Assuming successful identification or characterization of the toxicant(s), Tier 4 is to evaluate final effluent treatment options and Tier 5 is to evaluate within plant treatment options. Tier 6 consists of follow-up and confirmation once the toxicity control method has been selected and implemented.

Many recommended TRE elements parallel source control, pollution prevention, and storm water control program best management practices (BMPs). To prevent duplication of effort, evidence of complying with those requirements may be sufficient to comply with TRE requirements if the pollutants targeted by those programs are suspected to be the cause of the chronic toxicity. Support for this may include results of a Phase I TIE or other data as acceptable to the Executive Officer. By requiring the first steps of a TRE to be accelerated testing and review of the facility's TRE workplan, a TRE may be ended in its early stages.

Monitoring for chronic toxicity is required in three separate stages: routine, accelerated for confirmation, and monitoring under TRE. The monitoring under TRE will be specified in the TRE workplan.

The Board recognizes that identification of causes of chronic toxicity may not be successful in all cases. Consideration of enforcement action by the Board will be based in part on the discharger's actions in identifying and reducing sources of consistent toxicity.

8. Screening Phase for Chronic Toxicity

The discharger shall conduct screening phase compliance monitoring as described in the Self-Monitoring Program under either of these two conditions:

a. Subsequent to any significant change in the nature of the effluent discharged through changes in sources or treatment, except those changes resulting from reductions in pollutant concentrations attributable to pretreatment, source control, and waste minimization efforts; or

b. Prior to Permit reissuance, except when the discharger is conducting a TRE/TIE. Screening phase

monitoring data shall be included in the application for Permit reissuance. The information shall be as recent as possible, but may be based on screening phase monitoring conducted within five years before the Permit expiration date.

The discharger shall conduct screening phase compliance monitoring in accordance with a proposal submitted to, and acceptable to, the Executive Officer. The proposal shall contain, at a minimum, the elements specified in Part B of the Self-Monitoring Program of this Order, or alternatives as approved by the Executive Officer. The purpose of the screening is to determine the most sensitive test species for subsequent routine compliance monitoring for chronic toxicity.

9. Total Suspended Solids and Schedule

The discharger shall evaluate options for reducing suspended solids concentrations in their effluent. A report documenting the results of this evaluation shall be acceptable to the Executive Officer, and shall include a proposed methodology for suspended solids reduction.

Tasks	Compliance Date
a. The discharger shall submit a report, acceptable to the Executive Officer, documenting efforts made to reduce suspended solids concentrations in their effluent. This may include actions implemented based on recommendations made in the March 1988 pond study. The feasibility of further reduction shall also be discussed.	September 1, 2000
b. The discharger shall evaluate options for further reducing suspended solids concentrations in their effluent. A report, acceptable to the Executive Officer, documenting the results of this evaluation , proposing a methodology for suspended solids reduction.	April 1, 2001

10. Cyanide Reduction Study and Schedule

The discharger shall conduct a study to evaluate cyanide removals, possible generation within its treatment process, and possible analytical interferences per the findings, and in accordance with the following tasks and time schedule:

Tasks	Compliance Date
a. Submit a study plan, acceptable to the Executive Officer, for investigation source control options and treatment options to reduce cyanide concentrations in the treated effluent. The study plan shall include, but not be limited to, a technical analysis of cyanide removals across the Plant, and its potential for generating cyanide, as well as an evaluation of feasible source control measures to reduce influent cyanide concentrations, alternative treatment measures to reduce cyanide in treated effluent and alternate analytical methods to eliminate artificial results.	June 1, 1999
b. Following approval by the Executive Officer commence work in accordance with the study plan and time schedule submitted pursuant to Task 10.a.	60 days after EO approval
c. Submit a final report documenting the results of the study described in Task 10.a. The report shall include recommendations and an implementation time schedule on feasible source control measures to reduce	December 1, 2000

influent cyanide concentrations, alternate treatment measures to reduce cyanide in treated effluent, and alternate analytical methods to eliminate artifactual results. Influent and effluent concentration data shall be reported in both the monthly and annual self-monitoring reports.	

11. Lindane Reduction Study and Schedule

The discharger shall assess the feasibility of attaining the US EPA national criterion of 0.16 µg/L as described in the Findings. This evaluation shall consider reductions in Lindane effluent concentrations achieved through source control and economically feasible optimization of treatment plant removal efficiency. The discharger shall conduct a study, based on increased monitoring, to more accurately determine when and at what concentrations Lindane is present in the effluent.

Tasks	Compliance Date
a. The discharger shall submit a report, acceptable to the Executive Officer, documenting the results of increased monitoring for Lindane in the effluent. The feasibility of reducing Lindane concentrations in the effluent from either source control or treatment plant removal shall also be discussed.	November 1, 1999
b. Based on the results of Task 11.a, the discharger shall investigate and evaluate options for further reducing Lindane concentrations in their effluent. A report, acceptable to the Executive Officer, documenting the results of this evaluation and submitting a proposal of methods that could be used to further reduce Lindane concentrations.	November 1, 2000

12. Status Reports on New or Upgraded Facility

The discharger shall submit annual status reports on October 31 of each year. These reports shall be submitted at least annually until the new or upgraded facility is fully operational, and this permit amended to incorporate new information relevant to the plant. These status reports shall provide detailed discussion of progress made towards finalization of design, construction, and permitting of the new or upgraded facility, along with projected time schedules for future actions.

13. PAH and Other Organic Compounds Detection Limits

If the analytical methods for PAHs, or other organic compounds are improved or new methods developed which lower the analytical quantification limit below that specified in the Self-Monitoring Program, and the discharger, using the new or improved methods, finds these constituents consistently present at levels above their respective water quality objectives, the discharger shall notify the Executive Officer. The discharger shall also accelerate monitoring for these constituents to characterize the discharge, and, within 90 days develop and initiate a source identification and reduction investigation acceptable to the Executive Officer. During this time, compliance shall be determined at the former analytical quantification limit specified in the Self-Monitoring Program. "Consistently" as stated above is defined as present at levels above the respective objective in more than two consecutive monitoring events.

The discharger shall participate in a regional study to determine if alternative analytical methods with lower detection levels for PAHs and other organic compounds are currently available through

commercial laboratories. To the extent that non-EPA approved (40CFR136) methods are used, the results will not be used for compliance purposes.

Furthermore, if one of the following eight PAHs is found at levels equal to or greater than the practicable quantitation limit (PQL), then the discharger shall accelerate monitoring to one sample per month for each of the eight PAHs. The PQL shall be five times the method detection limit, which is presently 0.8 µg/L. If any of the eight PAHs is detected consistently for three consecutive months at or above the PQL, then the discharger shall notify the Executive Officer, accelerate monitoring, and initiate a source identification and reduction investigation. This program will include an investigation and evaluation of the collection system and pretreatment program.

Constituent	Unit	Detection Level	Monthly Average Effluent Limit
1,2-Benzanthracene	µg/L	0.8	0.049
3,4-Benzofluoranthene	µg/L	0.8	0.049
Benzo[k]fluoranthene	µg/L	0.8	0.049
1,12-Benzoperylene	µg/L	0.8	0.049
Benzo[a]pyrene	µg/L	0.8	0.049
Chrysene	µg/L	0.8	0.049
Dibenzo[a,h]anthracene	µg/L	0.8	0.049
Indeno[1,2,3-cd]pyrene	µg/L	0.8	0.049

14. Storm Water Pollution Prevention Plan

The discharger shall continue to implement their Storm Water Pollution Prevention Plan (SWPP) in accordance with the attached "Standard Storm Water Provisions". The SWPP plan shall be reviewed and updated as appropriate by October 1, every year. Full compliance with the "Standard Storm Water Provisions" shall be an enforceable requirement of this permit. The SWPP shall include a stormwater monitoring program, designed to meet the following objectives:

a. To monitor the quality of storm water discharges relative to Discharge Prohibitions, Effluent Limitations, and Receiving Water Limitations.

b. To aid in the implementation of the Storm Water Pollution Prevention Plan.

c. To measure the effectiveness of control measures and management practices in removing pollutants in storm water discharge.

15. Pretreatment Program

The discharger shall implement and enforce its approved pretreatment program in accordance with Federal pretreatment regulations (40 CFR Part 403), pretreatment standards promulgated under Sections 307(b), 307(c) and 307(d) of the Clean Water Act, and this Board's Order No. 95-015 with all amendments and revisions thereafter. The discharger's responsibilities include but are not limited to:

a. Enforcement of National Pretreatment Standards of 40 CFR 403.5 and 403.6;

b. Implementation of its pretreatment program in accordance with legal authorities, policies, procedures, and financial provisions described in the General Pretreatment regulations (40 CFR Part 403) and its approved pretreatment program;

c. Submission of annual and semi-annual reports to USEPA and the State as described in Board Order No. 95-015 and its amendments or revisions thereafter.

The discharger shall implement its approved pretreatment program and the program shall be an enforceable condition of this permit. If the discharger fails to perform the pretreatment functions, the Regional Water Quality Control Board (RWQCB), the State Water Resources Control Board (SWRCB) or U.S. Environmental Protection Agency (USEPA) may take enforcement actions against the discharger as authorized by the Clean Water Act.

16. Pollution Prevention Program

The discharger shall continue to participate in the Pollution Prevention Program, and shall continue to implement and expand its existing Pollution Prevention Program in order to reduce the loadings of targeted constituents to the treatment plant and, subsequently, to the receiving waters.

The discharger shall continue to submit annual reports by January 15th and progress reports by July 15th of each year that are acceptable to the Executive Officer. The reports should include (1) documentation of its efforts and progress, (2) evaluation of the program's accomplishments, and (3) identification of specific tasks and time schedules for future efforts. Duplicate copies of the reports shall be provided: one to the Board's NPDES Permit Case Handler and one to the Board's Pollution Prevention Coordinator.

17. Operations and Maintenance Procedures

The discharger shall review, and update as necessary, its Operations and Maintenance Procedures, annually, or within a reasonable time period after completion of any significant facility or process changes. The report describing the results of the review process including an estimated time schedule for completion of any revisions determined necessary, and a description or copy of any completed revisions, shall be submitted to the Board as part of the Annual Report, as described in Section F.5, Part A, of the attached Self-Monitoring Program.

18. Contingency Plan

Annually, the discharger shall review and update as necessary, its Contingency Plan as required by Board Resolution 74-10. The discharge of pollutants in violation of this Order where the discharger has failed to develop and/or adequately implement a contingency plan will be the basis for considering such discharge a willful and negligent violation of this Order pursuant to Section 13387 of the California Water Code. Plan revisions, or a letter stating that no changes are needed, shall be submitted to the Board as a part of the Annual Report, as described in Section F.5, Part A, of the attached Self-Monitoring Program.

19. Wastewater Facilities Management

The discharger shall regularly review and evaluate its wastewater collection, treatment and disposal facilities in order to ensure that all facilities are adequately staffed, supervised financed, operated,

maintained, repaired, and upgraded as necessary, in order to provide adequate and reliable transport, treatment, and disposal of all wastewater from both existing and planned future wastewater sources under the discharger's service responsibilities.

20. Self-Monitoring Program

The discharger shall comply with the Self-Monitoring Program for this order, as adopted by the Board and as may be amended by the Executive Officer.

21. Standard Provisions

The discharger shall comply with all applicable items of the attached "Standard Provisions and Reporting Requirements" dated August 1993, or any amendments thereafter, including Section A.12 concerning bypasses.

22. Change in Control or Ownership

In the event of any change in control or ownership of land or waste discharge facilities presently owned or controlled by the discharger, the discharger shall notify the succeeding owner or operator of the existence of this Order by letter, a copy of which shall be immediately forwarded to this office. To assume operation of this Order, the succeeding owner or operator must apply in writing to the Executive Officer requesting transfer of the Order. (Refer to Standard Provisions, referenced above). The request must contain the requesting entity's full legal name, the address and telephone number of the persons responsible for contact with the Board and a statement. The statement shall comply with the signatory paragraph described in Standard Provisions and state that the new owner or operator assumes full responsibility for compliance with this Order. Failure to submit the request shall be considered a discharge without requirements, a violation of the California Water Code.

23. Reopener

The Board may modify, or revoke and reissue, this Order and Permit if present or future investigations demonstrate that the discharge(s) governed by this Order will cause, have the potential to cause, or will contribute to adverse impacts on water quality and/or beneficial uses of the receiving waters.

24. Order Expiration

This Order expires on July 15, 2003. The discharger must file a Report of Waste Discharge in accordance with Title 23 of the California Administrative Code not later than 180 days before this expiration date as application for reissuance of waste discharge requirements.

25. Effective Date of Permit

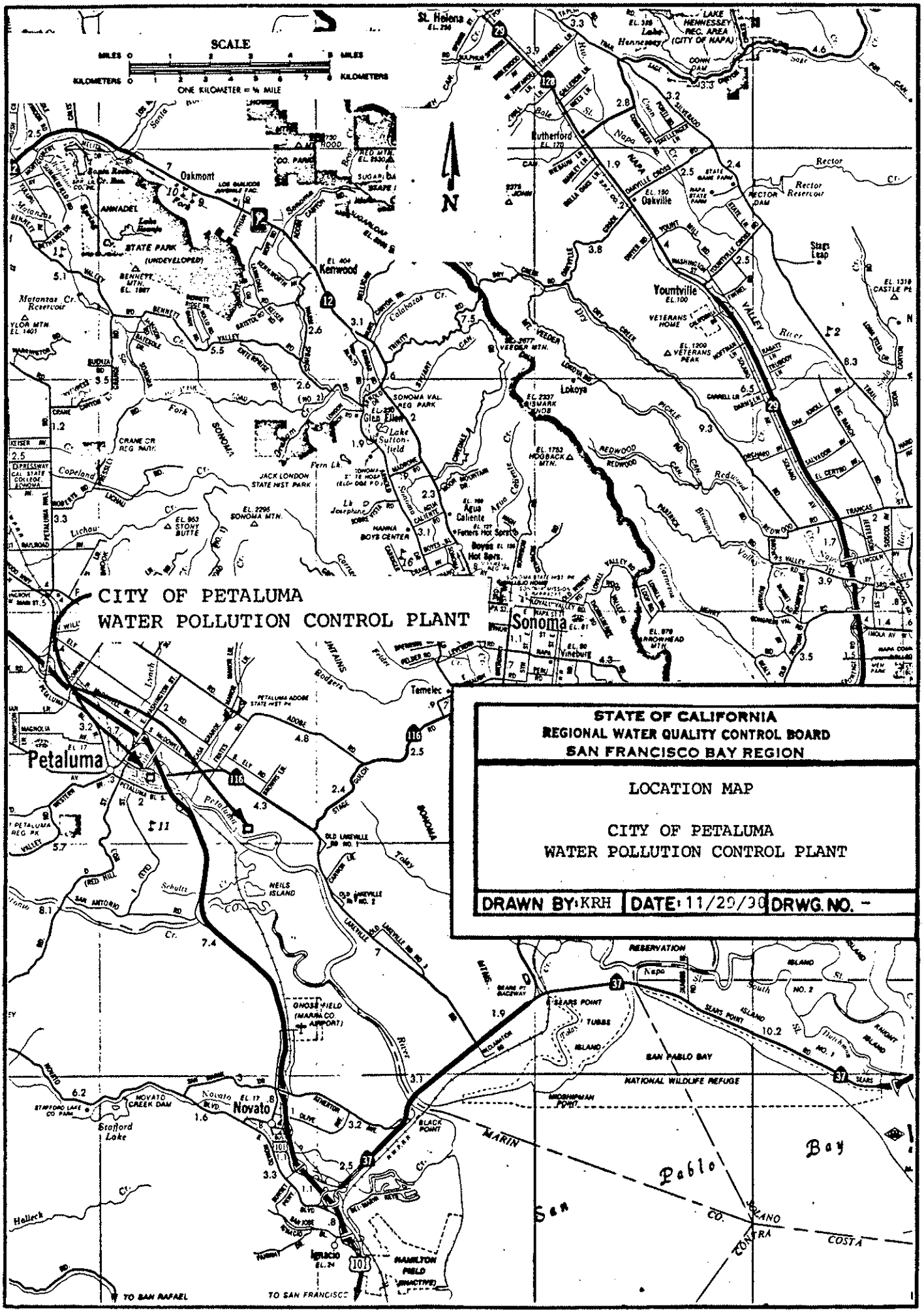
This Order shall serve as a National Pollutant Discharge Elimination System permit pursuant to Section 402 of the Clean Water Act or amendments thereto, and shall become effective on the date of adoption provided the Regional Administrator, United States Environmental Protection Agency, has no objection. If the Regional Administrator objects to its issuance, the permit shall not become effective until such objection is withdrawn.

I, Loretta K. Barsamian, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region, on July 15, 1998.

for LORETTA K. BARSAMIAN
Executive Officer

Attachments:

A. Location Map
B. Wastewater Process Schematic
C. Self-Monitoring Program
D. Standard Provisions and Reporting Requirements - August 1993

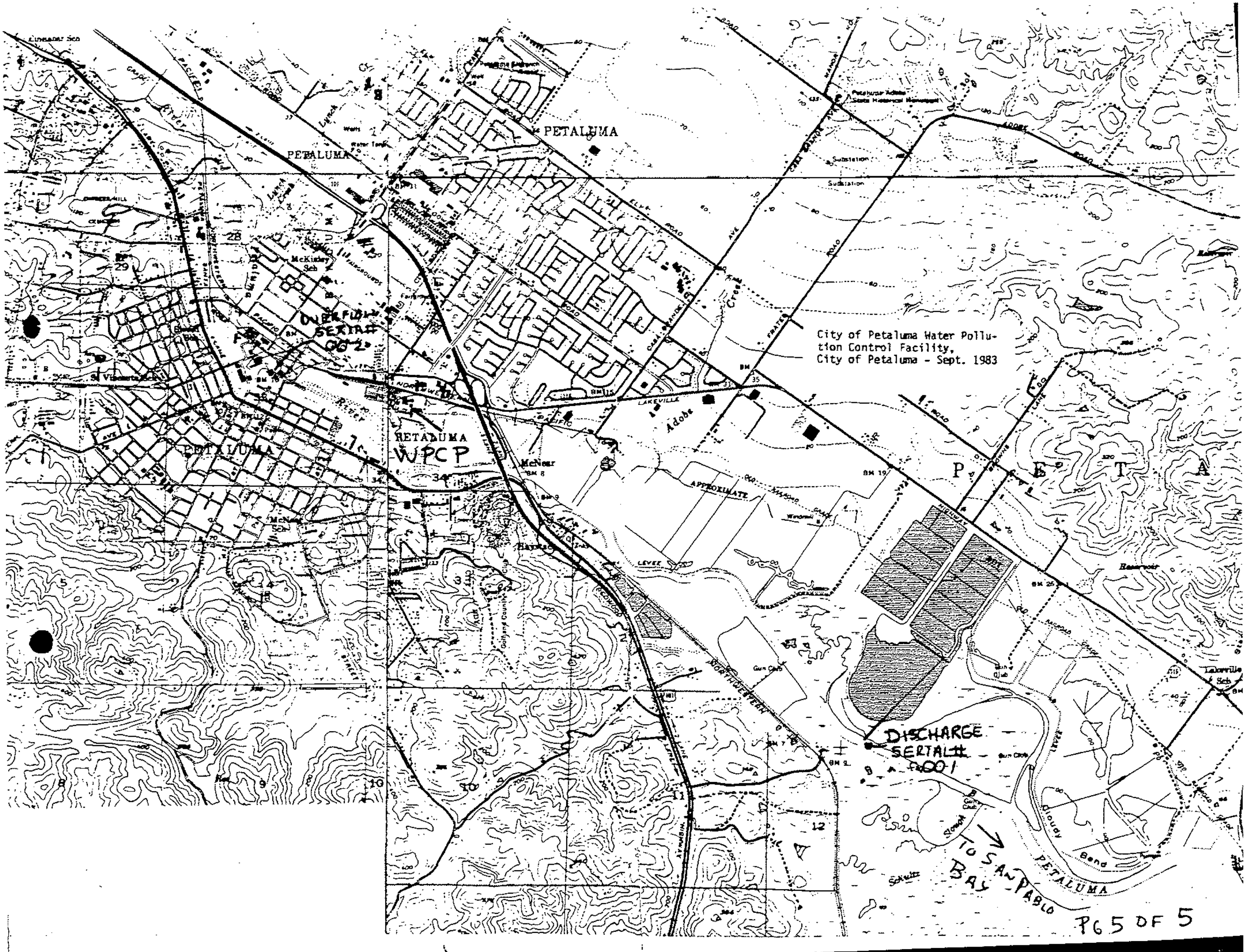


STATE OF CALIFORNIA
REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

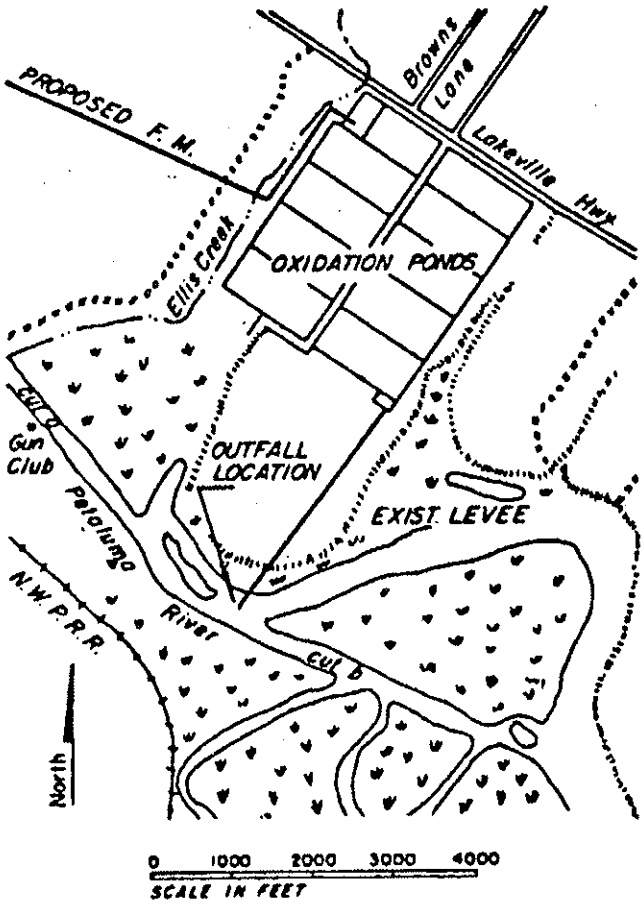
LOCATION MAP

CITY OF PETALUMA
WATER POLLUTION CONTROL PLANT

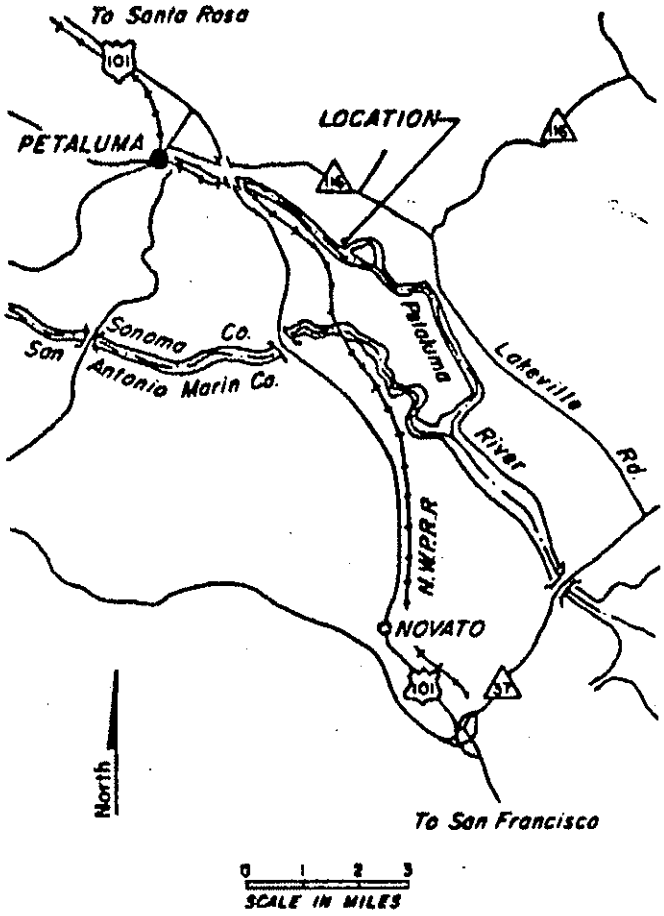
DRAWN BY: KRH	DATE: 11/29/30	DRWG. NO. -


City of Petaluma Water Pollution Control Facility,
City of Petaluma - Sept. 1983
PETALUMA
PETALUMA WPCP
OVERFLOW SERIAL # 002
DISCHARGE SERIAL # 001
TO SAN PABLO BAY
PETALUMA
Cloudy Bend
NORTHWESTERN
LAKEVILLE
APPROXIMATE
McNear
McKinley Sch
Adobe Creek
PG 5 OF 5

City of Petaluma Water Pollution Control Facility,
City of Petaluma - Sept. 1983

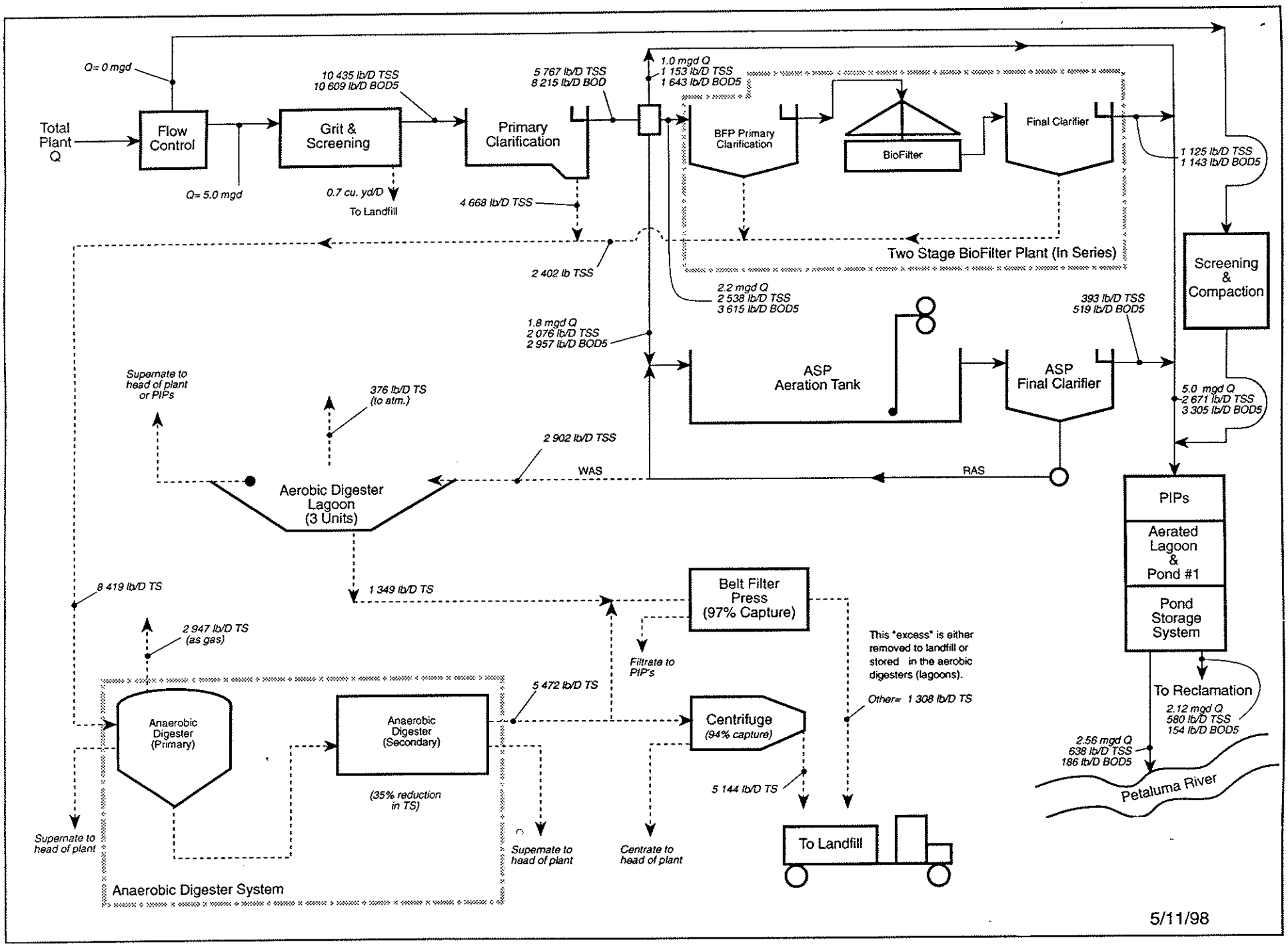


LOCATION MAP



VICINITY MAP

WASTE DISCHARGE LOCATION #001 Figure 2-1


Q= 0 mgd
Total Plant Q
Flow Control
Q= 5.0 mgd
10 435 lb/D TSS
10 609 lb/D BOD5
Grit & Screening
0.7 cu. yd/D
To Landfill
5 767 lb/D TSS
8 215 lb/D BOD
Primary Clarification
4 668 lb/D TSS
2 402 lb TSS
1.0 mgd Q
1 153 lb/D TSS
1 643 lb/D BOD5
BFP Primary Clarification
BioFilter
Final Clarifier
1 125 lb/D TSS
1 143 lb/D BOD5
Two Stage BioFilter Plant (In Series)
Screening & Compaction
2.2 mgd Q
2 538 lb/D TSS
3 615 lb/D BOD5
1.8 mgd Q
2 076 lb/D TSS
2 957 lb/D BOD5
393 lb/D TSS
519 lb/D BOD5
ASP Aeration Tank
ASP Final Clarifier
5.0 mgd Q
2 671 lb/D TSS
3 305 lb/D BOD5
Supernate to head of plant or PIPs
376 lb/D TS
(to atm.)
2 902 lb/D TSS
WAS
RAS
Aerobic Digester Lagoon (3 Units)
PIPs
Aerated Lagoon & Pond #1
Pond Storage System
8 419 lb/D TS
1 349 lb/D TS
Belt Filter Press (97% Capture)
2 947 lb/D TS
(as gas)
Filtrate to PIP's
This "excess" is either removed to landfill or stored in the aerobic digesters (lagoons).
Other= 1 308 lb/D TS
5 472 lb/D TS
Anaerobic Digester (Primary)
Anaerobic Digester (Secondary)
(35% reduction in TS)
Centrifuge (94% capture)
To Reclamation
2.12 mgd Q
580 lb/D TSS
154 lb/D BOD5
2.56 mgd Q
638 lb/D TSS
186 lb/D BOD5
Petaluma River
5 144 lb/D TS
To Landfill
Supernate to head of plant
Supernate to head of plant
Centrate to head of plant
Anaerobic Digester System
5/11/98

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

SELF-MONITORING PROGRAM

FOR

CITY OF PETALUMA
WATER POLLUTION CONTROL PLANT
SONOMA COUNTY

NPDES NO. CA0037810
ORDER NO. 98-076

CONSISTS OF

PART A (August 1993)
PART B
SELF-MONITORING PROGRAM
PART B

CITY OF PETALUMA
WATER POLLUTION CONTROL PLANT

I. DESCRIPTION OF SAMPLING STATIONS

A. INFLUENT

Station	Description
A-001	At any point in the treatment facilities headworks at which all waste tributary to the system is present, and preceding any phase of treatment.

B. EFFLUENT

Station	Description
E-001	At any point in the outfall from the treatment facilities between the point of discharge and the point at which all flow tributary to that outfall is present. (May be the same as E-001-D).

E-001-D	At any point in the disinfection facilities for flow E-001, at which point adequate contact with the disinfectant is assured.
E-001-S	At any point in the treatment and disposal facilities following dechlorination.

C. RECEIVING WATERS

Station	Description
C-1	At a point in the Petaluma River directly above the center of the diffuser.
C-2A	At points in the Petaluma River located 500 upstream and
C-2B	downstream, respectively, of the center of the diffuser.
C-R	At a point in the Petaluma River located 2,000 feet downstream from the diffuser.

D. LAND OBSERVATIONS

Station	Description
P-1 through P-'n'	Located along the corners and midpoints of the perimeter of the waste treatment facilities at equidistant intervals, not to exceed 200 feet. (A sketch showing the locations of these stations will accompany each annual report).

E. OVERFLOWS AND BYPASSES

Station	Description
O-1 through O-'n'	At points in the collection system including manholes, pump stations, or any other location where overflows and bypasses occur.

F. SLUDGE

The discharger shall chemically analyze sludge as necessary to comply with requirements for landfill disposal, or for reuse and/or disposal of sludge ash.

II. CHRONIC TOXICITY MONITORING REQUIREMENT

A. Test Species and Frequency: The discharger shall collect 24-hour composite samples of treatment plant effluent at the compliance point station specified in Table 1 of this Self-Monitoring Program, for critical life stage toxicity testing as indicated below. For

toxicity tests requiring renewals, 24-hour composite samples collected on consecutive days are required.

Test Species	Frequency
Mysidopsis bahia (Mysid shrimp), or *Pimephales promelas* (Fathead minnow)	Quarterly (during discharge season)

B. Conditions for Accelerated Monitoring: The discharger shall accelerate the frequency of monitoring to monthly (or as otherwise specified by the Executive Officer) when there is an exceedance of either of the following conditions:

1. three sample median value of 10 TUc, or
2. single sample maximum value of 20 TUc

C. Methodology: Sample collection, handling and preservation shall be in accordance with EPA protocols. The test methodology used shall be in accordance with the references cited in the Permit, or as approved by the Executive Officer. A concurrent reference toxicant test shall be performed for each test.

D. Dilution Series: The discharger shall conduct tests at 50%, 25%, 10%, 5%, and 2.5%. The "%" represents percent effluent as discharged.

III. CHRONIC TOXICITY REPORTING REQUIREMENTS

A. Routine Reporting: Toxicity test results for the current reporting period shall include at a minimum, for each test

1. sample date(s)
2. test initiation date
3. test species
4. end point values for each dilution (e.g. number of young, growth rate, percent survival)
5. NOEC value(s) in percent effluent
6. IC_{15}, IC_{25}, IC_{40}, and IC_{50} values (or EC_{15}, EC_{25} ... etc.) in percent effluent
7. TUc values (100/NOEC, $100/IC_{25}$, and $100/EC_{25}$)
8. Mean percent mortality ($\pm$s.d.) after 96 hours in 100% effluent (if applicable)
9. NOEC and LOEC values for reference toxicant test(s)
10. IC_{50} or EC_{50} value(s) for reference toxicant test(s)
11. Available water quality measurements for each test (ex. pH, D.O., temperature, conductivity, hardness, salinity, ammonia)

B. Compliance Summary: The results of the chronic toxicity testing shall be provided in the most recent self-monitoring report and shall include a summary table of chronic toxicity data from at least eleven of the most recent samples. The information in the table shall include the items listed above under Section A item numbers 1, 3, 5, 6(IC_{25} or EC_{25}), 7, and 8.

C. Reporting Raw Data in Electronic Format: The discharger shall report all chronic toxicity data upon completion of chronic toxicity testing in the format specified in "Suggested

Standardized Reporting Requirements for Monitoring Chronic Toxicity," February 1993, SWRCB. The data shall be submitted in either high or low density, double sided 3.5-inch floppy diskettes.

IV. SCHEDULE OF SAMPLING AND ANALYSIS

A. The schedule of sampling and analysis shall be that given in Table 1 (attached).

B. Sample collection, storage, and analyses shall be performed according to requirements in the latest 40 CFR 136, in the Permit, or as specified by the Executive Officer.

V. REPORTING REQUIREMENTS

A. General Reporting Requirements are described in Section E of the Board's "Standard Provisions and Reporting Requirements for NPDES Surface Water Discharge Permits", dated August 1993.

B. Self-Monitoring Reports for each calendar month shall be submitted monthly, by the twentieth day of the following month in accordance with Section F.4 of Part A.

C. An Annual Report for each calendar year shall be submitted to the Board within 60 days after the end of the year. The required contents of the annual report are described in Section F.5 of Part A.

D. Any overflow in excess of 1,000 gallons, any bypass, or any significant non-compliance incident that may endanger health or the environment shall be reported in accordance with Sections F.1 and F.2 of Part A as modified below, and any additional reporting guidance as may be provided by Board staff. Written reporting requirements for collection system spills and overflows may be satisfied by submittal of summary information with the monthly report.

E. Flow Monitoring and Reporting.

a. Influent and Effluent (A-001, E-001, E-001-D and E-001-S):
Flows shall be measured continuously, and recorded and reported daily. The following information shall also be reported, for each calendar month: Average, Maximum and Minimum Daily Flows (mgd).

F. BOD and TSS Percent Removal.
Percent removal for BOD and TSS shall be reported for each calendar month, in accordance with Effluent Limitation B.4.

G. Collection system sewage spills and overflows where the estimated quantity is over 100 gallons shall be reported in each monthly report. Summary information for each spill or overflow shall include the date, time, duration, location, estimated volume, cause, and any sampling data collected.

VI. MODIFICATIONS TO PART A & STANDARD PROVISIONS AND REPORTING REQUIREMENTS

A. This monitoring program does not include the following sections of Part A: C.3, C.5, and E.3.

B. The second sentence of Section F.1, Spill Reports, is revised to read as follows: "Spills shall be reported to this Regional Board (510-286-1255 on weekdays during office hours from 8 a.m. to 5 p.m.), and to the Office of Emergency Services (800- 852-7550 during non office hours) immediately after the occurrence.

Section F.1.b is revised to read: "Best estimate of volume involved".
Section F.1.d is revised to read: "Cause of spill or overflow".
Section F.1.i is revised to read: "Agencies or persons notified".

C. Section G, Definitions, No. 14, Overflows is revised to read as follows: "Overflow is defined as the intentional or unintentional spilling or forcing out of untreated or partially treated wastes from a collection or transport system (e.g. collection points, sewer system manholes, pump stations) upstream from the treatment plant headworks caused by excess flows, capacity restrictions, stoppages (obstructions, blockages, and/or structural failure), and the actions of others."

VII. MISCELLANEOUS REPORTING

A. The discharger shall retain and submit (when required by the Executive Officer) the following information concerning the monitoring program for organic and metallic pollutants.

a. Description of sample stations, times, and procedures.

b. Description of sample containers, storage, and holding time prior to analysis.

c. Quality assurance procedures together with any test results for replicate samples, sample blanks, and any quality assurance tests, and the recovery percentages for the internal surrogate standard.

B. The discharger shall submit in the monthly self-monitoring report the metallic and organic test results together with the detection limits (including unidentified peaks). All unidentified (non-Priority Pollutant) peaks detected in the USEPA 624, 625 test methods shall be identified and semi-quantified. Hydrocarbons detected at <10 μg/L based on the nearest internal standard may be appropriately grouped and identified together as aliphatic, aromatic and unsaturated hydrocarbons. All other hydrocarbons detected at > 10 μg/L based on the nearest internal standard shall be identified and semi-quantified.

I, Loretta K. Barsamian, Executive Officer, hereby certify that the foregoing Self-Monitoring Program:

1. Has been developed in accordance with the procedure set forth in this Board's Resolution No. 73-16 in order to obtain data and document compliance with waste discharge requirements established in Order No. 98-076.

2. Is effective on the date shown below.

3. May be reviewed at any time subsequent to the effective date upon written notice from the Executive Officer or request from the discharger and revisions will be ordered by the Executive Officer, pursuant to 40 CFR 122.62 and 124.4.

for LORETTA K. BARSAMIAN
Executive Officer

Effective Date: July 15, 1998

Attachments:
Table 1 - Schedule of Sampling, Measurement and Analysis Part A, dated August 1993
A. Chronic Toxicity Definition of Terms
B. Chronic Toxicity Screening Phase Monitoring Requirements

CITY OF PETALUMA
WATER POLLUTION CONTROL PLANT
NPDES Permit No. CA0037810
Self-Monitoring Program, Attachment A

TABLE 1

SCHEDULE FOR SAMPLING, MEASUREMENTS, AND ANALYSIS [1]

Sampling Station:	A-1	E-001			E-001- S			P	C	O
Type of Sample:	C-24	G	C-24	Co	G	C-2	Co	Ob	G[2]	Ob
Parameter (units) [notes]	[1]	[2]	[2]	[2]	[2]	[2]	[2]	[1]		[1]
Flow Rate (mgd) [3]	D			D						
BOD_5 (mg/L & kg/d) [4]	3/W		3/W							
Total Susp. Solids (mg/l & kg/d) [4]	3/W		3/W							
Chlorine Residual (mg/L) [5]			Cont/2H			Cont/2H				
Settleable Matter (ml/L-hr)		D								
Oil & Grease (mg/L & kg/d) [6]		M								
Total Coliform (MPN/100 ml)					5/W					
Acute Toxicity (% Surv.) [7]						M				
Chronic Toxicity [8]						3M				
Ammonia Nitrogen (mg/L & kg/d)					M				M	
Conductivity (µmhos/cm)									M	
Unionized Ammonia (mg/l as N) [9]									M	
Turbidity (NTU)					M				M	
pH (units)					D				M	
Temperature (^oC)					D				M	
Dissolved Oxygen (mg/l & % Sat)					D				M	
Sulfides, Total & Dissolved (mg/L/l) (if D.O. < 2.0 mg/L/l)					D				M	
Hardness (mg/L/l as $CaCO_3$)									M	
Total Dissolved Solids (mg/L/l)									M	
Chlorophyll-a (ug/L/l)									M	
All Applicable Standard Observations								M	M	E

Sampling Station:	A-1	E-001			E-001- S			L	C	O
Type of Sample: Parameter (units) [notes]	C-24	G	C-24	Co	G	C-24	Co	Ob	G	Ob
Arsenic (µg/L & kg/d)	Q		Q							
Cadmium (µg/L & kg/d)	M		M							
Chromium VI (µg/L & kg/d)	M		M							
Copper (µg/L & kg/month)	M		M							
Cyanide (µg/L & kg/d)	M		M							
Lead (µg/L & kg/d)	M		M							
Mercury (µg/L & kg/month)	M		M							
Nickel (µg/L & kg/d)	M		M							
Selenium (µg/L & kg/d)	Q		Q							
Silver (µg/L & kg/d)	Q		Q							
Zinc (µg/L & kg/d)	Q		Q							
Table 1A Constituents [6]			As indicated on Table 1A (Attached)							

LEGEND FOR TABLE 1:

Types of Samples

Co = Continuous
C-24 = 24-hour composite
G = Grab
Ob = Observations

Types of Stations

A = Treatment Plant Influent
E = Treatment Plant Effluent
O = Overflow and Bypass Points
P = Treatment Facility Perimeters
C = Receiving Water
L = Pond Levee Stations

Frequency of Sampling

D = Once each day
W = Once each week
M = Once each month
A = Once each year
Q = Once each calendar quarter (with with at least two month intervals)
E = Each occurrence
3/W = 3 days per week
2H = Every 2 hours
2M = Every 2 months
3M = Every 3 months

TABLE 1A

Monitoring Frequency for Priority Pollutants [10]

Constituent	Frequency	Notes/Comment
1, 2 - Dichlorobenzene	Q	
1, 3 - Dichlorobenzene	Q	
1, 4 - Dichlorobenzene	Q	
2, 4 - Dichlorophenol	Q	

2, 4, 6 - Trichlorophenol	Q
4 - Chloro - 3 - Methylphenol	Q
Aldrin	M
A - BHC	M
Benzene	Q
B - BHC	Q
Chlordane	Q
Chloroform	Q
DDT	Q
Dichloromethane	Q
Dieldrin	M
Diazinon	Q
Endosulfan	Q
Endrin	Q
Fluoranthene	Q
G - BHC (Lindane)	M
Halomethanes	Q
Heptachlor	Q
Heptachlor Epoxide	Q
Hexachlorobenzene	Q
PAH's	M [11]
PCB's	Q [12]
Pentachlorophenol	Q
Phenol	Q
TCDD Equivalents	Q [13]
Toluene	Q
Toxaphene	Q
Tributlytin	A

FOOTNOTES FOR TABLE 1 AND TABLE 1A

[1] Indicated sampling is required during the entire year.

[2] Indicated sampling is required during periods when effluent is being discharged to the Petaluma River.

[3] Flow Monitoring: Influent and effluent flows shall be measured continuously, and recorded and reported daily. For influent and effluent flows, the following information shall also be reported, monthly:

Daily:	Daily Flow (MG)
Monthly:	Average Daily Flow (MGD)
Monthly:	Maximum Daily Flow (MGD)
Monthly:	Minimum Daily Flow (MGD)
Monthly:	Total Flow Volume (MG)

[4] The percent removal for BOD and TSS shall be reported for each calendar month, in accordance with Effluent Limitation B.4.

[5] Chlorine Residual: Monitor dechlorinated effluent (E-001-S) continuously or, at a minimum, every 2 hours. Report, on a daily basis, the maximum chlorine residual for samples taken following dechlorination. If a violation is detected, the maximum and average concentrations and duration of each non-zero residual event shall be reported, along with the cause and corrective actions taken.

[6] Oil & Grease: Each Oil and Grease sample shall consist of three grab samples taken at equal intervals, no less than two hours apart, during the sampling day. Each grab sample shall be collected in a separate glass container, and analyzed separately. Results shall be expressed as weighted average of the three values, based upon the instantaneous flow rates occurring at the time of each grab sample.

[7] Bioassays: Effluent used for fish bioassays must be dechlorinated prior to testing. Monitoring of the bioassay water shall include, on a daily basis, the following parameters: pH, dissolved oxygen, ammonia nitrogen, and temperature. These results shall be reported. If a violation of acute toxicity requirements occurs, bioassay testing shall continue back to back until compliance is demonstrated.

The discharger shall use three-spined stickleback and fathead minnow as the compliance species for acute toxicity testing. Rainbow trout may be required as a compliance species, depending upon the outcome of testing pursuant to Provision F.3 of this Order.

[8] Chronic Toxicity: Chronic toxicity shall be monitored twice during each discharge season, with at least three months between the samples. At least one test period shall take place during the first six weeks of discharge.

[9] Monitoring for unionized ammonia, total dissolved solids, hardness, and chlorophyll-a shall only be performed at the following receiving water stations: C-1, C-2A, and C-2B.

[10] Selected Toxic Pollutant Monitoring: Monitoring for these constituents may be done in conjunction with that conducted for the Pretreatment Program; however, in addition to inclusion with Pretreatment submittals, the results shall be submitted with the monthly Self-Monitoring Report for the period of monitoring.

[11] PAHs (Polynuclear Aromatic Hydrocarbons): Polynuclear aromatic hydrocarbons, PAHs, shall be analyzed using the latest version of USEPA Method 610 (8100 or 8300). The discharger shall attempt to achieve the lowest detection limits commercially available. If an analysis cannot achieve a quantification limit for a particular sample at or below the effluent limits for PAHs, the discharger shall provide an explanation in its self-monitoring report. Note that the samples must be collected in amber glass containers. These samples shall be collected for the analysis of the

regulated parameters. An automatic sampler which incorporates glass sample containers, and keeps the samples refrigerated at 4°C, and protected from light during compositing may be used. The 24-hour composite samples may consist of eight grab samples collected at three hour intervals. The analytical laboratory shall remove flow proportioned volumes from each sample vial or container for the analysis.

PAHs shall mean the following constituents. Each constituent shall be limited individually at 0.049 µg/l as indicated below. If any of these PAHs are detected in the quarterly samples, monthly monitoring shall begin.

Constituent [a]	Unit	Monthly Average Effluent Limit [b]
1,2-Benzanthracene	µg/l	0.049
3,4-Benzofluoranthene	µg/l	0.049
Benzo[k]fluoranthene	µg/l	0.049
1,12-Benzoperylene	µg/l	0.049
Benzo[a]pyrene	µg/l	0.049
Chrysene	µg/l	0.049
Dibenzo[a,h]anthracene	µg/l	0.049
Indeno[1,2,3-cd]pyrene	µg/l	0.049

[a] The limit for PAHs, as defined by the Basin Plan, is the sum of about sixteen constituents measured in USEPA Method 610. The NTR, which is based on more updated data, list standards for just eleven of the PAHs measured in Method 610. The USEPA criteria for three of the eleven are higher than the other eight; these are anthracene (NTR objective at 110,000 ppb), fluorene (14,000 ppb), and pyrene (11,000 ppb). Therefore, the PAH limits in the current permit are for the other eight PAHs that may be present in the discharge at concentrations which pose a reasonable potential to contribute to water quality impacts.

[b] USEPA human health criteria calculations from the TSD, with updated cancer potencies (q*) and reference doses (RfD) from the California Office of Environmental Health Hazard Assessment, and in USEPA's Integrated Risk Information System (IRIS). Calculations based on average human body weight of 70 kg, USEPA estimated national average fish consumption of 6.5 g/d, and a 10^{-6} cancer risk level for carcinogens.

[12] PCBs: (polychlorinated biphenyls) shall mean the sum of chlorinated biphenyls whose analytical characteristics resemble those of Aroclor-1016, Aroclor-1221, Aroclor-1232, Aroclor-1242, Aroclor-1248, Aroclor-1254, and Aroclor-1260.

[13] Dioxins: Monitoring for TCDD Equivalents shall be done four times each year during the discharge period over the three year period 1998 through 2000. Thereafter, monitoring frequency shall be as specified by the Executive Officer. TCDD Equivalents shall mean the Chlorinated dibenzodioxins (2,3,7,8 - CDDs) and chlorinated dibenzofurans (2,3,7,8 - CDFs) as listed below. Data submitted shall include detection limits and concentrations of each of the following:

2,3,7,8 - tetra CDD1,2,3,7,8 - penta CDD
1,2,3,4,7,8 - hexa CDDs

1,2,3,4,6,7,8 - hexa CDDs
1,2,3,4,6,7,8 - hepta CDD
Total hepta CDDs
octa CDD
2,3,7,8 -tetra CDF
2,3,4,7,8 -penta CDF
1,2,3,4,7,8 -hexa CDF
1,2,3,6,7,8 -hexa CDF
2,3,4,6,7,8 -hexa CDF
1,2,3,7,8.9 -hexa CDF
Total hexa CDFs
1,2,3,4,6,7,8 -hepta CDF
1,2,3,4,7,8,9 -hepta CDF
Octa CDF"

General Notes

1. Bypass Monitoring: During any time when bypassing occurs from any treatment process (primary, secondary, chlorination, dechlorination, etc.) in the treatment facilities, the self-monitoring program shall include the following sampling and analyses in addition to the Table 1 schedule:

   a. When bypassing occurs from any primary or secondary treatment unit(s), composite samples on an hourly basis for the duration of the bypass event for BOD and TSS analyses, grab samples at least daily for Settleable Matter and Oil and Grease analyses; and continuous monitoring of flow.

   b. When bypassing the chlorination process, grab samples at least daily for fecal coliform analyses; and continuous monitoring of flow.

   c. When bypassing the dechlorination process, grab samples hourly for chlorine residual; and continuous monitoring of flow.

   d. Daily receiving water sampling and observations shall be performed until it is demonstrated that no adverse impact on the receiving water is detected.

2. Percent removal for BOD and TSS (effluent vs. influent) shall also be reported.

3. Grab samples shall be taken on day(s) of composite sampling.

4. If any sample is in violation of limits, sampling frequency shall be increased for that parameter until compliance is demonstrated in two successive samples. Frequency shall be increased as follows:

   - BOD, TSS, Sett. Solids, Coliform: Daily
   - Oil & Grease: Weekly
   - Acute Toxicity: As indicated in Footnote [6]
   - Metals & other priority pollutants: Monthly

5. Chlorine residual analyzers shall be calibrated against grab samples as frequently as necessary to maintain accurate control and reliable operation. If an effluent violation is detected, grab samples shall be taken at a minimum every 30 minutes until compliance is achieved.

6. Acute and chronic toxicity, and pH monitoring shall be conducted using dechlorinated effluent.

7. Grab samples shall be taken for volatile organic compound analyses.

8. Overflows:
   (a) Flow: For all overflow events, a best estimate of the total overflow volume (gallons) shall be reported.

   (b) BOD and Coliform: For any overflow event which involves discharge of wastewater to any surface water or waterway (including dry streams and drainage channels), grab samples shall be taken and analyzed for BOD, and both Total and Fecal Coliform.

9. Receiving water monitoring is to be done by high slack tide sampling.

10. All flow other than to the outfall (e.g. sludge) shall be reported monthly. Daily records shall be kept of the quantity and solids content of dewatered sludge disposed of and the location of disposal.

ATTACHMENT A

CHRONIC TOXICITY - DEFINITION OF TERMS

A. No observed effect level (NOEL) for compliance determination is equal to IC_{25} or EC_{25}. If the IC_{25} or EC_{25} cannot be statistically determined, the NOEL shall be equal to the NOEC derived using hypothesis testing.

B. Effective concentration (EC) is a point estimate of the toxicant concentration that would cause an adverse effect on a quantal, "all or nothing," response (such as death, immobilization, or serious incapacitation) in a given percent of the test organisms. If the effect is death or immobility, the term lethal concentration (LC) may be used. EC values may be calculated using point estimation techniques such as probit, logit, and Spearman-Karber. EC_{25} is the concentration of toxicant (in percent effluent) that causes a response in 25% of the test organisms.

C. Inhibition Concentration (IC) is a point estimate of the toxicant concentration that would cause a given percent reduction in a non-lethal, non-quantal biological measurement, such as growth. For example, an IC_{25} is the estimated concentration of toxicant that would cause a 25% reduction in average young per female or growth. IC values may be calculated using a linear interpolation method such as EPA's Bootstrap Procedure.

D. No observed effect concentration (NOEC) is the highest tested concentration of an effluent or a toxicant at which no adverse effects are observed on the aquatic test organisms at a specific time of observation. It is determined using hypothesis testing.

ATTACHMENT B

CHRONIC TOXICITY - SCREENING PHASE REQUIREMENTS

A. The discharger shall perform screening phase monitoring:

1. Subsequent to any significant change in the nature of the effluent discharged through changes in sources or treatment, except those changes resulting from reductions in pollutant concentrations attributable to pretreatment, source control, and waste minimization efforts, or

2. Prior to Permit reissuance. Screening phase monitoring data shall be included in the NPDES Permit application for reissuance. The information shall be as recent as possible, but may be based on screening phase monitoring conducted within 5 years before the permit expiration date.

B. Design of the screening phase shall, at a minimum, consist of the following elements:

1. Use of test species specified in Tables 1 and 2 (attached), and use of the protocols referenced in those tables, or as approved by the Executive Officer;

2. Two stages:

   a. Stage 1 shall consist of a minimum of one battery of tests conducted concurrently. Selection of the type of test species and minimum number of tests shall be based on Table 3 (attached); and

   b. Stage 2 shall consist of a minimum of two test batteries conducted at a monthly frequency using the three most sensitive species based on the Stage 1 test results and as approved by the Executive Officer.

3. Appropriate controls; and

4. Concurrent reference toxicant tests.

CHRONIC TOXICITY

TABLE B-1

CRITICAL LIFE STAGE TOXICITY TESTS FOR ESTUARINE WATERS

SPECIES	EFFECT	TEST DURATION	REFERENCE
alga (Skeletonema costatum) (Thalassiosira pseudonana)	growth rate	4 days	1
red alga (Champia parvula)	number of cystocarps	7-9 days	3
giant kelp (Macrocystis pyrifera)	percent germination; germ tube length	48 hours	2
abalone (Haliotis rufescens)	abnormal shell development	48 hours	2
oyster (Crassostrea gigas) mussel (Mytilus edulis)	abnormal shell development; percent survival	48 hours	2
Echinoderms (urchins - Strongylocentrotus purpuratus); (sand dollar - Dendraster excentricus)	percent fertilization	1 hour	2
shrimp (Mysidopsis bahia)	percent survival; growth	7 days	3
shrimp (Holmesimysis costata)	percent survival; growth	7 days	2
Topsmelt (Atherinops affinis)	percent survival; growth	7 days	2
silversides (Menidia beryllina)	larval growth rate; percent survival	7 days	3

TOXICITY TEST REFERENCES

1. American Society for Testing Materials (ASTM). 1990. Standard Guide for conducting static 96-hour toxicity tests with microalgae. Procedure E 1218-90. ASTM, Philadelphia, PA.

2. Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms. EPA/600/R-95/136. August 1995

3. Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms. EPA-600/4-90/003. July 1994

TABLE B-2
CRITICAL LIFE STAGE TOXICITY TESTS FOR FRESH WATERS

SPECIES	EFFECT	TEST DURATION	REFERENCE
fathead minnow (Pimephales promelas)	survival; growth rate	7 days	4
water flea (Ceriodaphnia dubia)	survival; number of young	7 days	4
alga (Selenastrum capricornutum)	cell division rate	4 days	4

TOXICITY TEST REFERENCE

4. Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms. Third edition. EPA/600/4-91/002. July 1994

TABLE B-3
TOXICITY TEST REQUIREMENTS FOR STAGE ONE SCREENING PHASE

REQUIREMENTS	RECEIVING WATER CHARACTERISTICS		
	DISCHARGES TO COAST	DISCHARGES TO SAN FRANCISCO BAY[1]	
	Ocean	Marine	Freshwater
Taxonomic Diversity	1 plant 1 invertebrate 1 fish	1 plant 1 invertebrate 1 fish	1 plant 1 invertebrate 1 fish
Number of tests of each salinity type: Freshwater[2] Marine	 0 4	 1 or 2 3 or 4	 3 0
Total number of tests	4	5	3

[1] Marine refers to receiving water salinities greater than 5 ppt at least 75% of the time during a normal water year.
Fresh refers to receiving water with salinities less than 5 ppt at least 75% of the time during a normal water year.

[2] The fresh water species may be substituted with marine species if:

1) the salinity of the effluent is above 5 parts per thousand (ppt) greater than 75% of the time, or

2) the ionic strength (TDS or conductivity) of the effluent at the test concentration used to determine compliance is documented to be toxic to the test species.